

RAILROAD AZETTE

A JOURNAL OF TRANSPORTATION.

VOL. XIV.—NO. 19.
FIRST QUARTER VOLUME.

CHICAGO, SATURDAY, AUGUST 6, 1870.

\$3 per Annum,
IN ADVANCE.

PUBLICATION OFFICE, 99 & 101 WASHINGTON STREET, CHICAGO.

INDEX TO RAILROAD ADVERTISEMENTS.

Page	Page
Chicago, Rock Island & Pacific Railroad.....450	Chicago, Alton & St. Louis.....452
Leavenworth, Lawrence & Galveston Railroad.....450	Hannibal & St. Joseph.....452
Chicago & Northwestern.....451	North Missouri Railroad.....452
Pan-Handle.....451	Pacific Railroad of Missouri.....452
Western Union.....451	Pennsylvania & Ft. Wayne.....453
Kansas Pacific.....451	Erie Railway.....453
Chi., Burlington & Quincy.....452	Illinois Central.....454
	Michigan Southern.....454
	Michigan Central.....455

For Table of Contents, see Page 449.

GRAVITATING WIRE ROPE TRAMWAYS.

Wire rope tramways of a number of different forms have been frequently proposed for freight transportation, usually in districts where grading would be difficult and expensive, as in mining regions, where it would be naturally supposed the adaptation of this method to the conveyance of minerals would be the most successful. Such an adaptation is, we believe, being made in some English mines, but we have as yet seen no reports of their success or otherwise. The accompanying engraving, for which we are indebted to the London *Mechanics' Magazine*, represents a system proposed by Mr. O. F. Palmer for transporting passengers as well as freight. The line is to be a double one, that is, one with two ropes for the grooved wheels of the carriage to run upon. A portion of the line forms an incline, down which the carriages will be run by their own weight, and the speed obtained in the movement will be sufficient to carry them up to near the highest part of the opposite gradient, when, by means of a chain which is to be hooked on at this point, power is applied by the winch to move it over the point on to the level, which is proposed to be formed of bar or plate iron, over which it travels, and then down the next incline to be again drawn up by another chain, and winch, and so on for the whole length of the line. For single lines, such as for transporting freight, the boxes hang under the overhanging arms of the uprights, and so as to pass freely and without coming in contact with the posts. Mr. Palmer has various modifications of his plans; among them is one by which rivers can be crossed with facility. One end of the rope or ropes is secured to a fixed post or upright, while the other end is free to be raised and lowered. By this means the carriage is caused to run from one side to the other, and *vice versa*, according to whether the post is higher or lower than the opposite end. The inventor claims that for ferry bridges his plan is the cheapest ever offered to the public, and no doubt it is, as in many cases the ropes need only be fastened to the trees on the opposite banks, when, on using two ropes, the full boxes could be sent in one direction on one of the ropes, and the empty boxes sent back again on the other rope. Upon trial on an extensive scale, the boxes or carriages traveled at the rate of fifteen miles per hour.

—The last number of the London *Railway News* says: "The existing political position and prospect of affairs in Europe at once puts a stop to all further loan operations on this or any other money market, the more especially for any European Government financial projects. Those that were to have been brought forward are postponed *sine die*."

—The telegraph lines in Russia are almost entirely worked by female operators.

Contributions.

THE USE OF IRON IN PERMANENT WAY.

BY WM. S. HUNTINGTON.

The question of substituting iron for wood in the construction of railway track has been the subject of considerable discussion of late among railroad engineers and others interested in the matter. It appears that iron has been successfully used in some countries, especially in India, where the nature of the soil and the climate are particularly favorable to the use of that material. It has been suggested by some that the scarcity of timber would render it necessary to substitute iron for wood in this country, and various plans of construction have been proposed, and several patents have been issued for certain modes of using iron in the construction of permanent way.

It is not probable, however, that any application of iron as a substitute for wood will ever come into general use in this country, for various reasons. First, there is

tute for wood in permanent way in this country is the action of frost. There are of course some sections where this would not be a serious objection, especially in the Southern States, but in such localities timber is abundant and there is no need of a substitute for that material. In regard to the expense, probably that would not be a serious objection in some portions of the country; but its practicability may be questioned, even in the most favorable localities.

Doubtless improvements will be made in the construction of permanent way, but as a certain degree of elasticity is indispensable in railway track, there would seem to be no possible chance for the successful use of iron as a substitute for wooden sleepers. The experiment on the Boston & Lowell road with granite ties years ago, and its results, are well known to all railroad men throughout the country, and in view of these facts it will not be an easy matter to induce railroad managers to experiment with iron as a support in place of timber.

I would suggest to the railroad community, however, that iron may be used to good advantage to a greater extent than it is at present, in the construction of permanent way. This may be done by putting a chair on every tie. This was done many years ago, but the kind of rail in use at that time required it. When the present style of rail came into use it was unnecessary. The object now in using a chair on every tie would be to raise the rail a sufficient distance above the tie to permit the covering of the entire surface of the ties with ballast, which would prevent decay. It is well known that when timber is only partially buried, the upper surface, being exposed to the weather, will decay much sooner than when it is entirely covered. Therefore it would seem that by raising the rail on chairs to the height of two or three inches, so that the ties may be covered their entire length, they would be kept in a sound condition long enough to make the expense of the chairs a good investment, and doubtless the expense of track repairs would be considerably lessened, as it is well known that all well covered track, such as that at stations where the ties are entirely covered, requires nothing like the attention to keep it in order that track remote from stations, where the ties are only partially covered, ordinarily requires. There would be several advantages arising from the use of this chair, and no inconveniences, as will be apparent to any experienced railroad man on giving it a careful consideration; and it would seem that any railroad company would do well to give it a trial.

—A company has been formed, under the title of the Liverpool & Mississippi Steamship Company, for the establishment of a line of steamers between Liverpool and New Orleans. Already two large steamers are on the stocks, specially designed for the New Orleans trade. The first steamer is being built by Messrs. G. R. Clover & Co., of Birkenhead, and is to be named the St. Louis; she will be of 1,750 tons burthen. Her engines are to be supplied by Messrs. J. Jack & Co., and are to be on the compound principle, and of 200-horse power. This steamer was to be launched about the end of July. The second steamer is to be named the Crescent City, and will be of 2,000 tons burthen; she is being built by Messrs. A. McMillan & Co., of Dumbarton, and will be fitted with engines of 210-horse power nominal, and upon the compound principle. The engines of the Crescent City are being made by Messrs. J. & J. Thomson, of Glasgow; the steamer is expected to be launched early this month.

not likely to be any scarcity of wood, and as wood is vastly superior to iron for that purpose, it does not seem that there will be any necessity for adopting iron, even if it will cost no more than wood.

By giving the matter a little attention, there need never be any scarcity of timber in this country for railroad purposes. Railroad companies have pursued a ruinous course in regard to saving timber by making improper use of it; that is, in localities where timber for ties was getting scarce, they have paid a high price for wood as fuel; and as the owners of timber along the line of railroads are disposed to sell it to the best advantage, they cut timber that would make first-class ties into cordwood, and the railroad company burns such timber as they need for ties, etc. Consequently they are obliged to pay an extraordinary price for ties, which they must have whatever the price. It would seem that if the supply of timber along the line of a railroad were not sufficient to supply both ties and fuel, it would be a matter of economy on the part of the company to see that the demand for ties was supplied first; for the lack of fuel could be supplied with coal, which, on most roads, is a cheaper fuel than wood. In timbered portions of the country, timber will grow as fast as it is needed for ties, and if it is not wasted by using it for fuel, there need never be any scarcity of timber for ties. Railroad men are becoming aware of this fact, and in some sections are taking measures for the preservation of timber, using no wood as fuel that can be used for other purposes.

Another obstacle in the way of using iron as a substi-

The London Underground Railway.

There is something very attractive—one might say poetic—in the resulting operations and effects of science, even to those to whom science itself is a name for weariness and unmitigated dryness. And, as illustrating these operations and effects, statistics themselves become glowing, and give food to the imagination as to the reason. Railways and railway-building are dryish topics; proper, it would seem, only to engineers and contractors on the one hand, and to legislators, directors, and shareholders, on the other; but something of romance may be picked out of them, sufficient to amuse the unscientific world. "Mugby Junction" was followed by a perfect shower of pithy stories about railways and railway traveling.

But the London Underground Railway is one of exceptional interest. It is one of the marvels of the age—a vivid illustration not only of human and scientific capabilities, but especially of that English dogged persistence, sturdy perseverance, ignorance of defeat, energy in reaching an end after starting for it, which beat the French at Poitiers and Agincourt, established the empire on which the sun does not set, and gave us steam-engines. Engineers, with their armies or navies, have been for these past seven years burrowing underneath this vast city, in this direction and that, in circles, diagonals, and right angles, under houses, and churches, and alleys, and parks, through London clay, and Roman ruins, and Saxon bricks, from the Squalor of the far east to the gorgeous Mammondom of the far west, and from the banks of the Thames to Highgate retreats, and the cozy nests of St. John's Wood; emerging here and there for a moment into the full light of day, then plunging again into blank, wet darkness; tunnelling, bracing, walling up, arching over, underpinning house-blocks, building buttresses, ranging "streets" and roofing with "cast-iron girders," erecting "transverse jack arches" and fitting "crossed purlins," laying these rails and building stations, running up ventilation-shafts, and finally setting the railway trains agoing therein to the number of some twelve hundred a day, one arriving every three minutes at each station, and about one hundred thousand passengers being conveyed hither and thither every day.

The London Underground Railway differs from all other English railways in this—that when it is finished it will have neither beginning nor end. "Other lines," says a London journal, "are alternations of cuttings and runs in the open, more or less elevated above the natural level of the surface, occasionally varied by a tunnel; this is a continuous burrow, a succession of covered ways, with troughs of various lengths at irregular intervals, open to the sky for light, but more especially for ventilation." On other railways you measure space by miles; but you count it by chains and furlongs. Other lines run a dozen, perhaps twenty, trains daily; the number of trains passing over the Underground every day is twelve hundred; the interval in running is otherwise counted by hours, and here by minutes. The most thriving of other lines do not count up more than one hundred pounds sterling a mile in their receipts; the Underground yields over one thousand pounds sterling a mile. In seven years, 150,000,000 people—the population of the United Kingdom six times over—have passed over this line; and on Whitsunday, 1869—the day when the greatest number went over it—the number of passengers traveling to and from the different stations was 189,499; the number for that week being 907,657! These facts at once prove the inestimable value and importance to Londoners of this Underground Railway, and show what a blessing it is to the vast population which must get quickly to its work, and to which the breath of country air, now within the reach of the poorest, is life and health.

The first portion of the Metropolitan Underground Railway, extending from Bishop's road to Farringdon street, was opened for public traffic on the 10th of January, 1863. It was then in the nature of an experiment. So prompt and grand was its success, that the work was continued, until now its ramifications extend in a thickly webbed net-work, from almost every central and suburban point where people live, to every central and frequented point where people work.

Extensions were rapidly made westward toward Hammersmith, and eastward into the "City," having termini at Moorgate and Broad streets; while a branch line, joining the first at Baker street, extending northward to the secluded quarter of St. John's Wood.

While one circle will carry you from Moorgate street via Euston road, Tottenham Court road, and Edgeware road, to Notting Hill and Kensington, an outer circle conveys you by Kings Cross to the northern chain of suburbs, notably to Kenish and Camden Town. As the enterprise has become more and more extended, new improvements have been added the tendency in England, as well as in America, being to increase the conveniences and luxuries of the traveler. More recently, open have been preferred to covered ways, or tunnels, and every opportunity has been taken to increase the one and lessen the other; so that the later ramifications are only to a certain extent "underground." When the property which had to be purchased has been moderate in price, the line of the road has simply been made a valley instead of a burrow. But when, as occurred in one instance the company has to purchase rows of costly mansions half built, this plan is too expensive. In many cases, the tunnels have been run underneath large buildings, which have been underpinned, the business in which was not for a moment interrupted. For three miles of railway, more than 50,000 cubic yards of earth was removed, and of the clay which partly composed it, 22,000,000 bricks were made! The new stations are admirable structures in their adaption to their purpose. The double station at Kensington High street is the largest and best of them, and may be briefly described.

The centre consists of a spacious and lofty apartment, forty-four by thirty-one feet, which is used as a refreshment-room. The two ticket-offices—for this station is double, as being a junction between two lines belonging

to different companies—are across the ends of the building. These, as well as the station walls and roofs, are very light, graceful, and effective structures. They are faced with white perforated bricks; the doors and windows have semicircular heads, and each window-sash is filled with a single sheet of plate-glass. The entrances to the ticket-offices are under iron verandas roofed with glass. These offices are of course on a level with the street; and the station is surmounted with an ornate cupola. Galleries cross the rails overhead for exit, entrance, or change of platform. Stairways descend underground from the offices to the platforms on either side, this subterranean apartment being lighted partly by skylights above, and partly by globular lamps suspended over the platforms on either side. The stations are abundantly supplied with closets neatly fitted up for the convenience of passengers. The platforms are plank floors, and are sufficiently long to secure six English cars forty-two feet long each, with engine and tender. Opposite the platforms, on the walls, are large signs with the name of the station; besides numerous advertisements of every imaginable commodity, in letters of every shape, size, and color. The arrangements are so perfect that there is room enough for all; and although the train stops seemingly an instant in each station, it does not start until every passenger is, as the case may be, in or out.

It is wonderful to consider this great Underground Railway on the side of the subject as it affects the people of London. In the first year of its establishment, 9,455,000 people passed over it, the receipts being £101,707; in 1864, the second year, there were 11,723,000 passengers, with the receipts increased to £116,500; in 1865, 15,763,000 passengers made use of it, and the receipts were £141,500; in 1866, passengers, 21,273,000, receipts, £210,000; in 1867, passengers 23,405,000, receipts, £233,000; in 1868, passengers, 27,708,000, receipts, £284,250; up to June 30, 1869, passengers, 20,000,000, receipts, £190,000. As in all other English railways, the cars of the Underground are divided into first, second, and third class, with accommodations and comforts corresponding, and fares graduated accordingly. It is not, therefore, surprising to learn that the number of third-class passengers has always been greatly in excess of those of the two other classes combined. The best patrons of the Underground are the artisans, the people who live by the toil of their hands and the sweat of their brow; and it is to this great class that the Underground has itself been a boon of a value to them incalculable. The percentage of first, second, and third class passengers passing over the road is relatively as follows: First class, 10.94; second class, 20.29; third class, 68.77. These figures of themselves show that the Underground is essentially and emphatically a people's line. They are carried to and from their business in well-built airy cars, which, if not cushioned and carpeted like the first-class cars, have at least clean wood seats, wide windows, and plenty of room. The average third-class fare for any distance is twopenny (four cents) each, being two-thirds less than the omnibus fares, the speed of transit being thrice as rapid. They may travel by trains running at intervals of five or ten minutes from five in the morning till half-past twelve at night. Their fare is almost saved in shoe-leather alone; for the laborer who now for his twopenny goes from his suburban cottage to his factory in the heart of the city, six miles, by steam, was wont formerly to trudge it wearily. More than shoe-leather—the wear and tear of the constitution is prevented, in the frequent foul weather of London; and the daily twopenny is a business investment, as preserving health and strength, that a little reflection will show to be simply practical and sound. It may be interesting to my readers to know how this great line is managed, and what measures have to be taken to insure the public safety and comfort. Probably there is no man in London with heavier responsibilities resting upon his shoulders than the manager of the Underground Railway. An outsider thinks that the working of the line is easy enough—it is only setting trains in motion, and keeping them running to time. The general manager is commander-in-chief of the line, and pays for this power and dignity by bearing the responsibility for everything which goes wrong, and by receiving but scant acknowledgement for the great deal that does go right, and for the inevitable anxiety and eternal vigilance which are indispensable in the performance of his office. It has, therefore, been found very difficult to select a manager who could and would assume its duties.

If, at half-past four a. m. we are "early birds" enough to be up, and find ourselves at the big shed of the Edgeware-Road station, we shall not have to wait long before seeing the engines "turned out," which initiatory operation takes place at twenty minutes before five. The night before, they have been thoroughly examined, oiled, cleaned, and prepared for the ensuing day's work. They start off in rapid succession to the different termini of the line, where the empty trains are sheltered during the night. At sharp ten minutes after five the trains begin running according to the time-tables, which are given free to the public, and which, in large type, are posted in all the stations. The engines arrive at the several stations in succession, leaving again with the trains attached ten minutes after: for example, an engine arriving at 5 a. m., leaves with a workman's train at 5:10 and so on. At first there is plenty of room in the trains, the travelers in the very early morning being scant groups of sleepy folks huddled napping in this corner and that. As the morning advances the traffic increases, and now the trains are run in quick succession, the average interval between them, throughout the day, being three minutes! At 7:37 p. m. the "withdrawal" of the locomotives begins, and continues till 1:15 a. m., when the last locomotive pulls into the Edgeware-road shed, which is the resting-place of all the engines for the night. The last train is the Hammersmith train, which steams into Moorgate street at 12:40, the average number of passengers for the twenty hours having been upward of a hundred thousand on the Metropolitan alone. Beside this traffic of the Metropolitan proper, the Great Western, Midland, Great Northern, and London, Chatham & Dover companies send more than four hundred

trains over the same rails every day. Of late, the Metropolitan, or principal underground company, has become a sort of key by which the traffic of nearly all the railways branching out of London is interchanged. You may procure tickets from its station to almost every point in the three kingdoms, and make connections accordingly from almost every part of the metropolis to your destination in the country. Extensions of the two lines, known generally as the Underground Railway, are constantly in progress. At one end the railway will be extended from Moorgate street, in the "City," to Liverpool street, in the far east-end of London, thus forming a connection with the whole Great Eastern system of railways, as yet isolated from this advantage. Then a section is just completed from Westminster to Cannon street, along the Thames, and by the Thames. These two extensions have long been sorely needed by Londoners, and for a good reason. One of the greatest blessings of the Underground Railway to the cockney world has been to thin out, in some degree, those choked-up, jammed-together-oppressively, dangerously-crowded thoroughfares which border near its termini. Hitherto, however, the great central artery, that which is most crowded and suffocated of all, has been unrelieved. Piccadilly, the Strand, Fleet street and Cheapside, have still, for the enormous traffic which perpetually rolls through them, only the poor locomotive media of cabs and omnibuses; and these impede rather than aid the unceasing tide of traffic. Yet another thoroughfare—the muddy Thames—will be relieved by the new line from Westminster, in the west, to Cannon street, in the east; for, if the thousands who now crowd the little penny steamboats, swarming businessward from Chelsea, Brompton, Pimlico, and that neighborhood, many will resort to the more rapid transit of the railway. Already, it is estimated, this "inner circle" of the Underground has thinned out a hundred thousand from the vast throng which used to choke the central thoroughfare of the metropolis. Statistics prove, too, that traveling by the Underground is less perilous to human life than riding or even walking in the streets. During last year nearly three hundred persons were knocked down and killed, by vans and other vehicles, in the London streets, beside the many hundreds who were injured, but more or less nearly escaped death. But of the one hundred and fifty millions who traveled by the Underground, but a very few lives were lost, and not a solitary one by any neglect or fault of the company's management. The section of the line which has just been opened between Westminster Bridge and Cannon street is about two miles long, and two thousand men were employed on it constantly day and night. The stations between the termini are at Hungerford Bridge, Norfolk street, Strand, and Bridge street, Blackfriars; and beyond Cannon street, at King William street, Mark Lane, Trinity Square, Aldgate, and, finally, Liverpool street, the extreme eastern terminus.

The entire length, or rather circle, of the Underground Railway, and all the branches are fitted up with the "block system," and the machine by which the trains are worked is so ingeniously designed, that it is almost beyond the range of possibility that a train should be run into a wrong section, or that there should be a collision. Nothing short of extreme negligence, or criminal design, could effect either of these calamities; for the instrument acts absolutely as a check upon any negligence on the part of the signal-man. The management exercises the greatest care in the selection of subordinates, and the rules by which the latter are controlled are despotically strict. No one is taken into the service without a "character," that is, a certificate of good behavior and habits from the previous employer; and, having entered the service, the employee is placed under very strict discipline—immediate dismissal being the peremptory penalty for carelessness. On the other hand, the employees are encouraged to do well by a system of reward; for a yearly bonus is given to those who faithfully and zealously perform their tasks.

With its omnibuses, its little Thames steamboats, and its Underground Railway, now, as has been seen, rami-fying in every part of the metropolis where traffic is to be relieved and the streets made passable, it would seem that London is well supplied with conveniences of locomotion. But this age, whether in England or this country, is never content with its new facilities. Already, before the Underground can be said to be completed, an agitation which promises success is on foot to establish horse railways. Such a project has been put into operation in Liverpool, and has received Parliamentary attention; and tracks are now being laid in the Whitechapel district, in the far eastern part of London, so that the experiment will be at least tried, though there is no predicting what "innovations" John Bull will assent to, until his assent is fully given. The later tendency in England is to give the government as large a control as possible over conveniences and institutions which are for the general benefit; and it may be that, in the course of time, there will not only be a government horse railway, but that the Underground will itself be bought in and governed by the ministers of the crown.—Exchange.

Proposed Paris Metropolitan Railroad.

The Paris correspondent of the *Engineer* writes as follows of a plan for connecting the railroads of Paris and providing communication between different parts of the city:

"A plan for a metropolitan railway, connecting all the central quarters of the city with the termini of the main railways, is under consideration. The concession is given provisionally to a company which is prepared to execute the line without any grant of money. The only question that retards the realization of this project is between the adoption of an aerial or a subterranean line; it is feared that the former would produce a disagreeable effect at the crossings of the streets, while the underground system would interfere greatly with the whole system of sewers, water, and gas-pipes. The opinion

seems to be that the use of Bessemer steel in the construction of light arches of considerable span will decide the question in favor of the arian system. In connection with this line for the rapid and economical transport of passengers the Administration proposes to add lines for the special service of the central market; but this latter project is not decided upon, the great difficulty being to create in the centre of Paris a sufficiently large station to receive all the goods that come to market daily, and which, as it is, crowd all the railway termini. At the time of the construction of the great central market provision was made beneath it for such a terminus, but we presume that the site is now found to be insufficient for the purpose."

CHICAGO, BURLINGTON & QUINCY RAILROAD.

Annual Report of the Directors and Officers for the Year Ending April 30, 1870.

PRESIDENT'S REPORT.

The following is the report of the President of the company, James F. Joy:

The following is a statement of the earnings and expenses, or of the transactions of the company for the year ending April 30th, 1870.

The gross earnings of the company for the year have been as follows:

From passengers.....	\$1,718,333 36
From freight.....	4,514,639 84
From miscellaneous business.....	388,820 50
Total.....	\$6,621,793 70
The operating expenses for the same period have been, including taxes.....	\$5,950,768 39
Net earnings.....	\$671,025 31
The amount of interest paid on bonds has been.....	496,252 09
Total.....	\$1,167,277 40
From which has been paid dividends, and taxes on same.....	\$1,600,831 57
Total.....	\$594,921 07
There has been paid into sinking fund.....	\$111,100 00
Leaving to be carried to account of surplus.....	\$483,821 07
And leaving, with surplus of last year, a present surplus of.....	\$896,602 97
If to this be added the amount now invested in the bonds of the company as a sinking fund, but which bonds are cancelled as purchased, say.....	\$1,147,861 13
Total.....	\$2,044,464 10
The surplus amounts to.....	\$2,044,464 10
The earnings, however, during the last year, have not been equal to those of the prior year by.....	\$191,086 06
And the expenses have been greater by.....	\$339,461 25
Making a difference in the net earnings.....	\$530,497 31

It will be seen that, while the earnings have been less in amount, the expenses have been considerably larger, being, during the past year, inclusive of taxes, 60 27-100 per cent. of gross earnings, while last year they were 53 58-100.

This increase in the proportion of the operating expenses has been partly owing to the diminished revenue, while the expenses could not be reduced in proportion; and partly, because there have been additional roads brought into use where the business, not being fully developed, and comparatively light, the ratio of expenses upon them has been greater in proportion to the business than elsewhere. The reduction of prices, for both passenger and freight business, has also, in some measure, affected the ratio of the expenses, as compared with the gross earnings.

There was in operation, including branches belonging to the company, at the date of last year's report, 477 1/2 miles of road. To this has been added, during the year, 125 1/2 miles.

The property of the company now consists of

The main stem or trunk to Galesburg of.....	165 miles.
The continuation to Quincy.....	100 "
" " Burlington.....	48 "
The branch from Buda directly south to Hannibal.....	106 1/2 "
From Galesburg to Peoria.....	53 "
From Burlington to Keokuk.....	43 1/2 "
From Burlington to Carthage.....	30 "
From Galva to New Boston.....	50 1/2 "
From Aurora to Turner Junction, old line.....	13 "
Total.....	608 1/2 "

Of these, the continuation to Quincy, and that to Burlington, connect with main trunk lines across Missouri and Iowa, the one to Kansas, and there connecting with its system of roads, and the other with Omaha and the Union Pacific, and may themselves appropriately be called trunk, or main lines. The average length of road in operation the past, as compared with the year before, has been 532 against 409 1/2, or 122 1/2 miles greater.

The gross earnings, therefore, have fallen off more than the statement in figures would indicate, because the extent of territory drained by the road has been greater than at any time before. The chief causes of this diminished revenue have been the loss of the corn crop last year almost entirely, and, to a considerable extent, also the two years before. Corn is the great staple of the State. A failure in its yield affects the business of the railroad in many indirect ways, as well as directly. It diminishes the number of cattle and hogs exported, and the quantity of lumber and merchandise imported into the country. The great amount of the falling off in this crop will be best seen by comparing the business of the road in its transportation for several successive years. The amount carried to Chicago over the road in 1867 was 460,081,097 pounds; in 1868 it was 284,981,687; in 1869 it was 270,596,621; in the past year it has been 201,532,717, much less than half the amount of 1867; and 85,000,000 less than in 1868; and about 70,000,000 less than it was last year, or, in other words, about 3,500 car-loads less than last year, and upwards of 12,000 car-loads less than in 1867. Corn is mainly transported during the next year after its production, and furnishes business for the whole of the year. The large business of the year of 1867 was from the yield of 1866. The crop of 1867, which furnished our business for 1868, and also that of 1868, were greatly injured by the frosts. The excessive rains of last year almost entirely destroyed the yield of the year.

The business of this spring and the past winter have, therefore, been very light in this article, and will continue so during this season. Since the first opening of the road, it is believed that there has been no year in which the production of this great staple has been so small.

The business in cattle and hogs has been more nearly up to that of the past years, though the number of hogs transported has been 40,000 less than last year. That this part of our business has been so well maintained, however, has been owing to the extensions of territory tributary to our road, not only in Illinois, but in Iowa and Kansas. Being of more condensed value, they can be taken from greater distances. All local business has, of course, been affected by the loss of the great staple, which also, in itself, is the largest item of purely local traffic. The extension of the roads in Kansas, Iowa and Missouri has enlarged the markets for lumber, the quantities of which transported from Chicago have steadily increased, which, also, may be said of the through business in general. The revenue from it, however, has by no means been in comparison with the increase in the amount of the business. There are three rival roads from Chicago to western Iowa and Nebraska, and three, also, to Kansas across Illinois and Missouri. All business done between Chicago and those great sections of country, is carried on with great competition, and with consequent reduction of prices, and with comparatively small profits.

It will be seen, therefore, that the local traffic of the road has fallen off for the reasons above stated, while the long and less valuable business has considerably increased—the aggregate of both being not greatly less than that of the year before—yet the aggregate profits have been largely diminished. With the usual average crops, it is believed we might reasonably have expected our large annual increase of business, and with the enlarged area for local traffic which the road now commands through its branches, there seems to be no reason to apprehend that the annual increase may not correspond with the increased extent of country reached by it.

The passenger business of the company has been largely in excess of that of 1868-9, the prior year. The revenues from it have been in excess only \$59,014.77, the fares having been considerably reduced below the average of the former year. The whole net earnings for the year, from both freight and passenger business, above all operating expenses and interest, and the amount paid for bonds for sinking fund and cancelled, has been about fifteen per cent. on the average capital of the year.

It is known to all stockholders, that since the war, and with the ease with which capital has been, and still is obtained for the construction of railroads, and especially with the stimulus of county and township aid, generally given as a bonus, several new roads have been projected in the sections adjacent to and occupied by the road of this company. Indeed, there is now no considerable section of country unoccupied by a railroad which will consent to remain without one. It has been, and still is, a question of great importance whether we should aid such as might be made tributaries, and control and make them friendly allies, or withhold the aid requisite to accomplish this, and allow these new enterprises to seek other connections and become the allies of rival roads for business. Not so far as would have been judicious and wise, but so far as at the time when the opportunity arose it was deemed expedient to do so, we have adopted the policy of rendering the needed assistance, and acquired the roads aided as allies and friends, or as the property of the company. In one or two cases, it has erred in withholding aid. In the several cases where it has been given, though for a time it has involved large expenditures, it is fully believed that the company will receive much direct benefit, while, at the same time, it has warded off much of its impending future difficulty and injury to its business. Indeed, to two of the roads where such aid was given, and which were the occasion of the largest expenditure and embarrassment, it has been greatly indebted for its subsequent success and prosperity. All these enterprises to which it has for three years past been giving aid, are now completed, and though one or two of them, at the close of the fiscal year, can hardly be said to have been open for business, still they all begin to show good results.

The Lewiston Branch, from Yates City to Lewiston, long since fully paid for itself in the business which it brought to the road of this company. That portion of the road formerly styled the American Central, between Galva, on our main trunk, and New Boston, on the Mississippi, was next opened, a distance of fifty miles, about eight months since. It has since added to the revenues of this company \$184,009.68, with a disastrous year, as it may be styled, for business. That from Burlington to Keokuk has been open about six months, and has added to our gross revenues \$69,966.26. The Peoria & Hannibal, which is the extension of the Lewiston Branch to Rushville about thirty miles, and which has been open about the same time, has produced \$79,876.

The Dixon, Peoria & Hannibal, so called, which is about forty-four miles long, is properly an extension of the Lewiston & Rushville Branch, northward, till it strikes the main trunk at Buda, is not quite ready for use, but is doing considerable business. This branch from Buda to Rushville constitutes a direct line running south from Buda one hundred miles, all the business of which will pass over the main line to Chicago, about one hundred and twenty miles, and will, for local traffic, be quite as important as the same distance on the main line, and constitutes the shortest possible line from the country through which it runs to Chicago. The Carthage & Burlington road, though its main line has been some time laid, yet was received by this company without side-tracks or stations, and not in a condition for business. It can, therefore, hardly be said to have been opened up to the close of the fiscal year. These things have now been to a great degree remedied, and we may reasonably expect a fair

contribution from that road in the future. Its traffic will pass two hundred and forty miles over our main line to Chicago. It is quite possible that the expectations which have been formed of business from some of these auxiliary roads may not be fully realized, but from the experience thus far of their business, and the rapidity with which it increases upon those which have been longest in use, it is the full conviction of the board that all the money expended upon them has not only been safely expended, but in nearly all the cases it has been a necessity as well as a profitable investment. They are all substantially complete, without need of any further considerable expenditure.

There has been laid, during the year, of side and double track thirteen and a half miles and for the distance of eighty-two miles between Chicago and Mendota, considerably more than one-half is double track. The whole track of the lines between Chicago, Quincy and Burlington, and most of the branches are in excellent order, generally fully ballasted, and all the appointments of the road are in better condition than at any former period.

There are about six miles of steel rail in our tracks. When we first began the use of this rail as an experiment, there were found a number of rails so brittle that quite a number broke, and in one or two instances a rail was known to have broken into three pieces by the passage of a train. In the annual report of that year, it was stated that the experiment had not answered the expectations formed from it. Since the first year, however, no breakages have occurred, and it has become apparent that steel rails are a success. At some points on the road where the wear of the rail is very great, the steel is apparently as perfect as when it was placed in the track, while fifteen iron rails exposed to the same wear have been worn out and removed. Since the first breakages, when the rails were first placed in the track, this is the uniform result of our experience thus far. It has been enough to prove that economy will require the replacing of the iron with the steel rail, as fast as may be practicable.

Our traffic with both the Hannibal and the Burlington & Missouri is steadily increasing. The latter has been but recently opened, and its business is not developed, but there is no doubt but that it will become a valuable auxiliary to our business. Our interchange of business with it the past year has been worth to us, in gross earnings, \$431,197.17. The traffic with the Hannibal & St. Jo. has been worth to us, in gross earnings, in the same time, \$1,087,018.97.

The rapid development of Kansas and Nebraska, which states are now being intersected by railroads in every direction, the striking improvement in Missouri, and the opening of all Western Iowa by railways, and the settlement and progress of the territories further west, indicate, not only a continued, but a still more rapid increase of business on the roads west of the Mississippi, than has been the case in the past. The completion of the Kansas Pacific to Denver, now certain at an early day, as well as a connection with the Union Pacific, will give a strong impetus to business over the whole line of road from Chicago to Kansas City, as well as to Omaha. With bridges over the great rivers in that direction, and an unbroken and easy connection between all the roads, and free from the annoyance and great expense of transfer by ferries on such a river as the Missouri, the route by Quincy will however have great advantages in the contest for the command of business.

In the report of last year, a very full statement was given of the expenditures which had then been made, not only upon the branch roads mentioned, upon the Burlington bridge and the grounds west of the Mississippi, at that point, but also in the improvements and double track along our lines. Those expenditures were not then at an end, as they now substantially are.

There has been issued and sold to Stockholders at par, during the year, to meet all these extraordinary expenditures:

Stock to the amount of.....	\$2,764,400
The capital stock of the company now stands at.....	16,580,510
The debt of the company for which bonds and scrip are outstanding is.....	4,640,790
There remains uncalled for, also, under the decree of the court foreclosing the mortgage on the Northern Cross-road, now the road from Galesburg to Quincy.....	970,000

This money was due to bondholders, and has not been called for, and by order of the court remains in the treasury of the company, subject to the order of the court.

In addition to this are the indirect liabilities of the company, being the amount of bonds issued by the various companies whose lines, or parts of whose lines, this company has aided to construct as above stated, and which have generally, by lease or otherwise, become substantially the property of this company, and all of which portions of road so built, are tributary roads directly furnishing business to our main trunk road to Chicago.

These bonds are secured by mortgages made by the companies upon the portion of roads leased to our company, and are liable to be redeemed from the net earnings of the business added by those roads to the general business of our road.

These bonds are eight per cent. bonds, and issued at different times, and amount in the gross, upon all the branch roads, to \$3,800,000.

The business, or net profits to this company from the business furnished to it by those roads, will, it is believed, in six or eight years, absorb those bonds entirely, leaving the lateral roads the property of this company at only the cost of the money which it has advanced to aid in their completion.

The habit which has become general in the country, of aiding in the construction of railroads by county or town subscription to stock, or in the way of donation, has stimulated the construction of railways to a great extent, it has become a system of speculation by parties who are engaged in the business, and is leading to the building of many roads which will in themselves be unprofitable, while with the amount supplied by the public as a bonus, or as stock, the contracting speculator may make money from the construction.

These roads thus built will, in many instances, yield but little revenue, while also, in many cases, they will affect the values of existing railway property. At no time in the history of railways in this country, it is believed, has there been so great an excitement on this subject, or so universal disposition to invest money in enterprises of this nature. It would be extraordinary if a revulsion did not follow.

The territory through which our lines run is not exempt from this fever, and, to some extent, the revenues of the company will, in the future, be doubtless affected by it.

On looking over the whole ground, however, the board sees no good reason to suppose that the property of the company will not, in the future, continue as valuable as in the past.

For more full details of the finances of the company, reference is had to the report of the Treasurer, and for expenditures upon the road, to the report of the Chief Engineer, and for its general management and details connected with the operating department, to the report of the Superintendent.

TREASURER'S REPORT.

The report of the Treasurer, Amos T. Hall, presents statements of general accounts, income account, sinking fund account, and monthly earnings and operating expenses.

The following is a summary of the general accounts:

DEBIT.	
Capital stock, April 30, 1870.....	\$10,590,510 00
<i>Funded debt:</i>	
Convertible sinking fund 8 per cent. bonds, payable Jan. 1, 1883, still outstanding.....	\$150,000 00
Inconvertible, ditto.....	2,570,000 00
First mortgage 7 per cent. bonds, payable October 1, 1890.....	400,000 00
Second mortgage 4 1/2 per cent. bonds (4 per cent. after July 1, 1890), payable at Frankfort-on-the-Main.....	941,000 00
Total interest-bearing bonds.....	\$4,367,000 00
Scrap to be paid in 13 semi-annual installments of \$41,750 each at Frankfort on account of the Northern Cross road.....	283,750 00
Total funded debt, bearing an average interest of 6 1/2 per cent.....	\$4,650,750 00
Amount due under decree foreclosing mortgage on the Northern Cross road, not yet called for by bondholders.....	270,000 00
Due for unclaimed dividends, accounts and pay-rolls, agents and connecting roads.....	\$389,861 97
Bills payable.....	500,000 00
Sinking fund.....	1,147,861 12
Balance to credit or income account.....	896,662 97
	\$34,904,346 07

CONSTRUCTION ACCOUNTS:

Cost of 400 miles of road and equipment reported last year.....	\$19,861,428 64
Expended for construction and equipment during past year.....	1,084,133 78
American Central Railway construction account paid by this company.....	406,203 99
Extension Lewiston Branch road construction account paid by this company.....	287,033 93
Keokuk & St. Paul Railroad construction account paid by this company.....	251,060 40
Carthage & Burlington Railroad construction account paid by this company.....	64,511 01
Burlington & Missouri River Railroad stock bonds.....	496,966 27
Burlington depot grounds and accretions.....	295,534 17
1,372 shares Pullman Palace Car Company stock.....	113,100 00

OPERATING ACCOUNTS:

Material on hand for future operations.....	485,894 52
Wharf and ferry boats.....	28,565 89
Chicago teams for transferring freight.....	5,312 50

MONTHLY TRAFFIC ACCOUNTS:

Accounts and bills receivable.....	597,785 78
Post Office Department.....	10,869 41
Due from agents and connecting roads.....	165,947 86
Deposits in New York and Boston and in the Treasury.....	187,517 85

The income account gives the receipts as stated in the President's report. The sinking fund account shows \$77,000 of Chicago & Aurora second mortgage bonds, \$724,000 Chicago, Burlington & Quincy inconvertible 8 per cent. bonds, \$11,000 Chicago, Burlington & Quincy convertible 8 per cent. bonds, and 280,000 Chicago, Burlington & Quincy trust mortgage 7 per cent. bonds; a total of \$1,092,000 of bonds purchased at a cost of \$1,147,861.13—an average premium of 5 1/2 per cent. The premium on the bonds last purchased (inconvertible 8 per cent.) was 10 per cent.

SUPERINTENDENT'S REPORT.

The following is the report of Robert Harris, the General Superintendent, some details being omitted:

A comparison of the statistics of the year ending April 30, 1870, with those of the preceding year, shows as follows:

Earnings from	1869.	1870.	Increase.	Decrease.
Passengers.....	\$1,659 3/8 61	\$1,7 8/13 38	\$59,014 77	
Freight.....	4,7 5/8 64 29	4,514,639 94		\$244,335 05
Miscellaneous.....	894,636 28	888,520 50		6,115 78
Total.....	\$6,812,809 18	\$6,621,773 12	\$19,036 06	
Actual decrease.....				
Expenses.....	1869.	1870.		
Exclusive of taxes.....	\$3,390,111 19	\$3,754,553 36		\$364,442 17
Taxes.....	960,185 95	235,213 03		724,972 92
Total.....	\$4,350,307 14	\$3,989,766 39		\$360,540 75
Ratio of expenses to earnings.....	63 85-100 per cent.	59 70-100 per cent.		
Exclusive of taxes.....	49 76-100 per cent.	56 70-100 per cent.		
Inclusive of taxes.....	63 85-100 per cent.	60 27 100 per cent.		

To the 447 1/2 miles of road in operation at the beginning of the year, there were added during the year:

From	1869.	1870.	Total.
Lewiston to Rushville (opened July 18, 1869).....	33 1/2		33 1/2
Burlington to Ft. Madison (opened October 27, 1869).....	18 1/2		18 1/2
Burlington to Carthage (opened January 16, 1870).....	30 1/2		30 1/2
Buda to Elmwood (opened February 1, 1870).....	44 1/2		44 1/2
Total.....			126 1/2
Average length of road in operation during the year ending April 30, 1870.....			608 1/2

Average length of road in operation in the year ending April 30, 1869.....

The earnings from business to and from the Hannibal & St. Joseph Railroad were:

	1869.	1870.
Passengers.....	\$189,199 96	\$253,546 78
Freight.....	513,775 83	633,472 15
Total.....	\$702,975 79	\$1,087,018 93

The earnings from business to and from the Burlington & Missouri River Railroad were:

	1869.	1870.
Passengers.....	\$75,891 01	\$96,741 45
Freight.....	390,332 23	544,456 72
Total.....	\$472,123 24	\$641,197 17

The tonnage to and from the Hannibal & St. Joseph Railroad was:

	1869.	1870.
Eastward.....	44,397 tons.	38,407 tons.
Westward.....	58,614 "	187,963 "

The tonnage to and from the Burlington & Missouri River Railroad was:

	1869.	1870.
Eastward.....	55,671 tons.	45,041 tons.
Westward.....	91,387 "	32,407 "

The tonnage to and from Chicago and local points on the Chicago, Burlington & Quincy Railroad, including Burlington and Quincy, was:

	1869.	1870.
Eastward.....	433,197 tons.	339,651 tons.
Westward.....	369,818 "	496,175 "
Total.....	803,015	835,826

Total number of engines on hand at the beginning of the year.. 135
Bought with the Keokuk & St. Paul Railway..... 3
for which the Keokuk & St. Paul Railway was credited \$17,000.
New engines bought in the year..... 15

Total number on hand..... 153
Amount charged to "New engines" in the year has been.. \$256,538 00
Total amount charged to "New Cars" in the year..... 145,493 75

Three first-class passenger coaches, one second-class passenger coach, one baggage car, thirty-two box cars and thirteen platform cars were bought with the Keokuk & St. Paul Railway, for which \$43,000 has been charged to "Equipment" account.

In addition to these there have been added to "Car Equipments":

Passenger cars, 12 wheels.....	6
Passenger cars, 8 wheels.....	11
Platform and coal cars.....	17
Drivers' and conductors' cars.....	29
(Three made over from old baggage cars.)	8
Tool car.....	1
Rubble cars.....	30
Hand cars.....	38

The equipment of cars is now as follows:

Passenger coaches, 12 wheels.....	26
Passenger coaches, 8 wheels.....	44
Baggage, mail and express, 12 wheels.....	12
Baggage, mail and express, 8 wheels.....	23
Pay car.....	1
Freight and stock cars.....	2,159
Platform and coal cars.....	700
Drivers' and conductors' cars.....	69
Gravel and dirt cars.....	4
Tool car.....	1
Pile driving car.....	1
Rubble cars.....	158
Hand cars.....	181
Wrecking cars.....	9

Amount expended for "Repairs of Cars" has been \$458,100 85.

There has been expended on account of track and side tracks \$251,291.93, \$142,557.52 of which was for finishing double track between Aurora and Bristol, Earl and Leland.

A fire-proof brick freight house has been erected at Quincy—in place of that burned August 30, 1869—at a cost of \$28,669.98, being \$18,669.98 over and above the value of the one burned.

The road from Lewiston to Rushville was opened for business July 18, 1869. All of the station houses have been finished, and the road has been thoroughly fenced. The whole amount expended on this road, on account of construction, in the year, has been \$340,324.27.

The American Central Branch has been finished to New Boston. This road is also thoroughly fenced, and commodious station houses have been erected at all stations. The amount expended for the road, on account of construction, in the year, has been \$335,935.44.

The Keokuk & St. Paul road, from Keokuk to Fort Madison, was bought February 10, 1869, and completed to Burlington October 27, 1869. New ties have been put in between Keokuk and Fort Madison. The bridges have been rebuilt, station houses erected at Keokuk, Montrose and Fort Madison, an engine house erected at Keokuk, and frost-proof tanks at Montrose and Fort Madison. The rail between Keokuk and Fort Madison is light—45 pounds per yard—but in good order. The rail from Burlington to Fort Madison is 50 pounds per yard.

It is very necessary that the fencing should be finished, as the road runs either through cultivated farms or where the safety of the trains is endangered by cattle.

The whole amount expended during the year in renewing the old road from Keokuk to Ft. Madison, and in building the new from Burlington to Ft. Madison, was \$527,516.49.

The Carthage & Burlington road was opened for business January 16, 1870. There has been expended on account of it \$562,432.87. Small station houses are being put up at Shokokon, Dallas, Patterson's Hutchinson's and Carthage; and one will be needed at Ferris, where the road crosses the Toledo, Peoria & Warsaw Railroad; also, an engine house for two engines, and a turn-table at Carthage.

This road is also through cultivated farms, and should be fenced.

At most of the stations on this road facilities for handling grain are being created, and we may reasonably look for a compensating business from this branch.

The Dixon, Peoria & Hannibal road, from Buda to

Elmwood, was opened for business February 1, 1870. The whole amount expended on account of it has been \$895,165.28.

A large part of this road has been graveled. The road is thoroughly built, and when it is fenced and the station houses erected, it will be well up to the standard condition of the rest of the road.

Being through an old and well-settled country, the local traffic from it must be equal in bulk to that of any other part of the line.

To finish the fencing and station houses and surfacing the track, an expenditure of about \$40,000 more will be required.

Additional shop conveniences at Aurora should be provided at an early day; and the large passenger business centering at Galesburg makes it very desirable to have more convenient accommodations at that point.

The growth of the local business of the Burlington & Missouri River road, at Burlington, makes the continued joint occupancy with that road, of their freight house, very inconvenient to the business of both roads, and a freight house for the accommodation of the business of this company should be erected there.

The unusually high water in the Mississippi River this spring—higher than any since 1851—shows us that the embankment across the bottoms between Sagetown and Burlington should be raised about two feet to place the road beyond the liability of being washed away. To do this properly, and secure the work with riprap, will cost about \$20,000.

With this exception, and those already mentioned in connection with the several new branch roads, there seems to be no call for any large expenditures for the present.

The great economy in the use of steel rail has been so fully shown by our own experience, as well as by that of other roads, I would recommend that a portion of the track be relaid with it each year.

FREIGHT AUDITOR'S REPORT.

From the report of W. McCredie, Freight Auditor, we learn that the road received from and delivered to its western connections the following amounts of freight:

	Received from.	Delivered to.
Hannibal & St. Joseph.....	36,681	63,848
Cameron & Kansas City.....	11,736	69,130
Burlington & Missouri River.....	45,041	32,407
Totals.....	93,458	175,385
Earnings.....	\$380,534 25	\$797,393 62

There were moved on the road 798,937 tons of freight exclusive of that received from and delivered to western connections, and the Illinois Central Railroad, and the earnings from this freight were \$2,908,115.65. The earnings per ton per mile on through freight averaged 1.86 cents, and on local 3.76 cents.

The Illinois Central business, between Chicago and Mendota is accounted for separately. During the year 33,262 loaded and 1,221 empty cars were moved eastward, and, and 14,539 loaded and 16,832 empty cars were moved westward for this road. The tonnage was 372,225 tons eastward 109,760 westward. The average tonnage was 10 tons 166 pounds per loaded car and 7 tons 638 pounds per empty car. The average earnings per ton per mile on this business were 1.19 cents.

The chief freights westward were lumber, lath, shingles, "sundries," iron, salt, coal, agricultural implements wagons, cooper stock, posts and railroad ties. Eastward the chief freights were corn, hogs, cattle, oats, flour, wheat, rye, stone and marble, coal, grass and other seeds, barley, sheep, mill stuffs, dressed hogs, lime, and hides, nearly in the order of the amounts.

The Michigan Railroad Bonds.

The committee of the Michigan Legislature, now in session to discuss the propriety of submitting to the people amendments to the constitution which will authorize municipal subscription to railroads, or at least legalize those already issued, has reported the following amendments, which at last advices had not been acted upon. The sections are to be a part of Article 18:

SECTION 16. All aid voted by any county, city, township or village previous to the 27th day of May, A. D., 1870, to aid any railroad company in the construction of its road, in accordance with the provisions of any act of the Legislature of this State, shall be, and is hereby made valid, and such acts, and the acts creative of action thereunder, shall be deemed so far valid as shall be necessary to support, enforce, and collect the aid voted in accordance therewith, prior to the said 27th day of May, 1870. *Provided* that no bonds or other evidence of indebtedness shall hereafter be delivered to any such railroad company, unless such company shall, before the 27th of May, 1873, comply with the conditions upon which such bonds or other evidences of indebtedness were voted; and *provided further*, That no such bonds, or other evidences of indebtedness, shall be delivered to any company which shall have received, since the 27th day of May, 1870, any money or other consideration from any such county, city, township or village, or inhabitants thereof, in lieu of such aid voted, unless such company shall have agreed to replace such money, or other consideration, with such aid, when delivered to it.

SEC. 17. The Legislature may provide by law that cities, incorporated villages and townships, may aid by loan or donation in the construction of railroads, *provided* a majority of the tax-paying electors so determine; and, *Provided further*, That such aid shall not exceed five per cent. of the equalized valuation of such municipalities, and shall be raised and paid by annual tax within five years after the road is completed through such municipality.

Railroads in Europe and the United States.

The August number of *Old and New* contains in its "Record of Progress," the following article by Edward Howland:

The system of circulation in the body politic is as definite and unfailling an indication of organization and life in society as it is in the animal world. From the polyp to man, the ascending gradations of completeness in the circulatory system are evidences of a more perfect organization of life, and of a higher rank in the scale of being. The same test may be applied to society; and the growth of civilization will be found always accompanied with perfecting the roads, so that the circulation of men and material can be accomplished with a less expenditure of force, and in a more thorough manner. In this view of the matter, the invention of the railroad is the most important event in the modern history of society, and is peculiarly important in this country, since it affords a means for the necessary intercommunication of the most distant portions, and for the first time in history renders the organization of a nation, spread over as large a territory as ours, possible without a centralization which represses the activity of the distant portions in order to keep them in subjection. Oregon and Maine are now practically nearer together than Boston and Pittsburgh were seventy years ago.

Our railroad system is therefore a matter of national importance, and should be seriously considered by any one who is interested in our progress. The railroads are as important to the nation as the streets of a city or the roads of a village are to their inhabitants; and it is as mistaken a policy to allow them to be governed by private corporations, as it would be to place the right to our streets and turnpikes in the same hands. The people make a great mistake in ever surrendering to corporations the ownerships of the railroads. There is an excuse for it; the advantage of a railroad seemed so great when they were first introduced, we did not know how important they would become, and we followed the English plan. But now let us do the best we can to remedy the error.

It would have been the best course, at the beginning, to build our railroads as we do our county roads, at the expense of the county, or the State, and thus have made them public property, to be used for the public benefit. All of the European countries, except England, recognized the importance of the railroads at their introduction; they saw how necessary it was that so valuable a right should not be surrendered by the public to any private corporation, and were wise enough to act accordingly.

In France, railways were first introduced in 1836; and there are now over nine thousand miles in operation, making an average of two and a half miles to every ten thousand inhabitants, or four and a half miles to every one hundred square miles of territory. The average cost of the construction of these railroads was about one hundred and twenty-five thousand dollars a mile. The roads are leased to six great companies, who operate them, and pay the State ten per cent. upon their gross receipts. The Government aided in their construction by loans of money, and by constructing the earth-works and the bridges. The leases under which the companies hold possession are for a term of ninety-nine years, after which the roads, with their stock and buildings, are to revert to the Government entirely. Meanwhile, however, the mails are transported by the roads free of charge, and the soldiers and officers of the Government are transported at a reduced charge; while the Government fixes the rates for both passengers and freight which the roads charge to the public, and guarantees the roads from any infringement upon their business by the construction of any competing road. The rates are low, but yet high enough to make the enterprise so profitable that the stock of all the French railways commands a premium in the market. From their yearly profits the railroads are also obliged, by the conditions of their lease, to put by yearly a fund for paying back their capital to the shareholders, when, the term of the lease having run out, the roads will become the property of the Government. By this means the capital of the shareholders being rendered secure, and paying a good dividend, the shares are, of course, steadily at a premium; and the element of stability, so entirely wanting in railway investments in England and this country, is given to this kind of investment. The average working expense of the French railroads is about thirty-eight per cent. of their gross receipts.

In Belgium, there are one thousand two hundred and fifty miles of railroad, making an average of two and a half miles to every ten thousand of the population, or ten miles to every one hundred square miles of territory. These railroads were constructed at an average cost of \$91,500 a mile. They were partly constructed by the State, and partly by companies, who were given the privilege, on condition that they should absorb their capital by a system called *amortization*, and by which a portion of their earnings should be used, not as dividends, but to repay their capital; and that, when this was done, the roads should be the unencumbered property of the State. At first, the railways in Belgium paid no profit, as the fare was placed very low; but, as this system increased the public prosperity by offering a means of cheap circulation, the business so increased that the lines have become very profitable, and their receipts help largely towards the expenses of the government. In 1865, M. Vaederstichelen, the Minister of Public Works, in his report to the Chamber of Representatives at Brussels, said, "Since 1856, that is to say, in eight years,—

"First, The charges on goods have been lowered on an average of twenty-eight per cent.

"Second, The public have dispatched 2,706,000 tons more, while they have economized more than twenty millions francs (\$4,000,000) on the cost of carriage.

"Third, The public treasury has realized 5,781,000

francs (\$1,156,200) more, after having paid the cost of working, and the interest on capital. Being in this prosperous situation, the government have asked if the time has not come to turn their attention to the second part of the problem of cheap transportation. In other words, whether it is not proper to apply to the service of passengers the principles which have given such satisfactory results to that of goods. The government is of opinion that facility and cheapness of traveling are, in principle, as fruitful of benefits to all classes of society as the economical transport of goods can be for the producers and consumers."

The Chamber having agreed, the rates of fare were lowered, and the success has been better than was anticipated. The Belgian roads now return a larger profit than ever before, being an average of seven per cent. The relative cheapness of the fares is shown in the following comparison. From London to Dover, seventy-eight miles, a first-class ticket cost £1, about five dollars; a second-class, fifteen shillings, \$3.75; while from Ostend to Brussels, eighty-nine miles, a first-class ticket costs five shillings—\$1.25, and a second-class ticket, three shillings and fourpence—72 cents, the rate of travel on both lines being about the same—a little under forty miles an hour.

The following extract from the testimony given by M. Fassiaux, the Director General of the posts, railways and telegraphs of Belgium, before an English commission, shows the spirit in which the Belgian Government considers the railways and the advantages of their system: "The experience obtained in Belgium of the working by the State of at least a portion of the railways existing in that country is entirely in favor of that system. The results are better in a financial point of view; and, notwithstanding this superior financial result, the lines worked by the State are those kept in the best order. The working of them gives the greatest satisfaction to the commercial world and to the public in general, as regards regularity and convenience, cheapness of transit, and comfort of passengers. The State, not being solely guided by the prospect of financial gain, but having constantly in view the interest of the public which it represents, is in a better position than private companies to introduce all desirable improvements, not only as regards the efficient performance of the service, but also as respects the cost of conveyance; without, however, altogether disregarding the increase of revenue which its operations bring into the public treasury."

Prussia has three thousand eight hundred miles of railroad, making an average of two miles to each ten thousand of the population, or four miles to each one hundred square miles of territory. The average cost of construction was \$83,700 a mile. The comparative cheapness of their construction comes from the fact that care is taken to avoid the preliminary expenses of organization. As was said before the Parliamentary Royal Commission upon railways, "The various expenses of one kind and another accompanying the passing of railway bills in England, before a sod was dug, would amount to something very nearly like the cost of the whole Prussian railway system." Of the Prussian railways, about one-half are worked by the government, and the other by private companies, under concessions from the government upon terms similar to those in France. The government is also very careful in not allowing any line to be constructed which shall compete with any other. The fares on all the roads are fixed by the government. The profit upon the capital invested has averaged from five to eight and a half per cent., the higher rate being made by the private companies.

In Austria, there are about three thousand seven hundred miles of railroads, making an average of one mile to each ten thousand of population, or two-thirds of a mile to each one hundred square miles of territory. The average cost of their construction was \$108,500 a mile. The financial condition of the State forced it to leave the construction of these roads to companies, but under the condition that at the end of ninety years the roads become the unencumbered property of the State. The rates of fare are fixed by the government, who have reserved the right to alter them whenever the necessity should arise. The roads have proved profitable to the stockholders, paying an average dividend of seven per cent.

In all these countries, the importance of the railroad as a public convenience has been recognized, and the mistake of placing so indispensable a monopoly in private hands has been avoided. The advantages have been, to the public—first, that the rates have been made low; second, that railroad stocks have been made stable and secure; third, that the profits have not gone into private hands, thus tending to strengthen a monopoly in opposition to the public, but into the treasury of the State, thus diminishing the taxes; and, fourth, that the sentiment between the railroads and the public is one of friendship, since their interests are mutual, instead of being antagonistic.

In England an entirely different policy was pursued, and has produced entirely different results. Railways have been built by private companies; and it has been supposed that competition would secure for the public cheapness of transit and stability in railroad investments. The Report of the Royal Commission on Railways gives us the data for judging how far this supposition has proved true. The Stockton & Darlington line was opened in 1825, but the speculative mania for railways did not set in until 1844. That year, projected railways requiring a capital of nearly \$75,000,000 were granted charters by Parliament. The next year, 1845, the amount was \$220,000,000; and the next, 1846, \$607,000,000. The amount asked for in 1846 was \$2,000,000,000; but Parliament was prudent, and limited their favors to \$607,000,000. This conservatism is the more praiseworthy, since it is said that one hundred and fifty-seven members of Parliament were pecuniarily interested in the schemes proposed that year. The parliamentary expenses of the Liverpool & Manchester Railway were \$135,000, about \$5,000 a mile; and it is said that the solicitors' bill for promoting a scheme which never reached Parliament was \$410,000.

There are now 14,247 miles of railway in England,

representing an aggregate capital of \$2,511,314,435, and occupying two hundred and eighty-nine square miles of territory, or one acre in every two hundred and seventy-three of England and Wales, one in every eight hundred and thirteen in Scotland, and one in every eight hundred and fifty-three in Ireland. These lines carry on the average nearly 1,000,000 of passengers every day, and in 1866 dispatched 6,000,000 trains, for freight and passengers, which traveled more than 163,000,000 miles. It would seem that an amount of business like this should be made profitable; and yet the railway system of England is next door to bankruptcy. In fact, the statistics of 1867, is compared with those of 1866, show that the gross receipts had increased \$6,578,225, while the working expenses had increased \$5,186,395, which was a higher ratio than before, and caused a decrease of their already slim dividends. So involved have the railways become, and their market value is so depressed, causing such wide-spread disaster, that it has been proposed that the government should purchase all the lines. The London, Chatham & Dover, with a capital of \$50,000,000, has never paid any dividend, nor even the interest on its first issue of bonds, and is now hopelessly insolvent, in the hands of a receiver. Yet this is the chief route connecting Paris and London. Nor is this the only one of the English railways that has been placed in the receiver's hands, while the stock of every one of them is heavily depreciated on the market.

The reasons for this failure are various, and not the least of them is incompetent management. The lines have been organized and engineered upon the market as stock speculations rather than as industrial enterprises. To every railroad was attached an army of directors, managers, clerks, and officials of all kinds, who were generally paid, not for services rendered, but for the influence their reputation and credit might have in inducing subscriptions to the stock. The free competition in railways made it a good speculation to propose lines which should compete or interfere with some previously established line, which would, in self defence, be forced to buy them up. This was one of the chief reasons why the preliminary expenses were so heavy. Then, too, the English railways have never learned the true theory of railway management, that of cheap rates. Great as the travel in England has been, the inducement of cheapness has never been held out to the masses to use the railroads; and cheapness is the only inducement which can influence them. In 1866, the average number of passengers to a train was only seventy-five; although one thousand is not enough to overload a train. Yet, on the Continent, and in some isolated cases in England, it has been proved, beyond question, that a reduction in the rates always increases the number of travelers in a ratio more than sufficient to make up the loss. It is the same problem which the postoffice has solved. A high rate of postage makes the postoffice service an expense, while a cheap postage gives a revenue.

Here in the United States the railroads have been built and are owned by private corporations; and the evils of allowing so valuable a monopoly to remain in private hands have more than begun to display themselves. The corporations have seen the folly of competing with each other, and have thus combined; and now there are States of the Union whose political and financial policy is directed and controlled by railway rings. The increased cost of coal, in which every one is interested, is one of the evils. The monopoly of railroads lies like an embargo between the grain fields of the West and the sea-coast. With corn in the East over one dollar a bushel, it is burned in Illinois by the producers. Gov. Palmer of Illinois, in a letter to the convention of farmers at Bloomington, proposes, as a remedy, that the roads should be made free to all carriers of freight and passengers, upon terms to be fixed by the State, and under the laws applicable to turnpikes. This would, however, be a mere half-way measure. Every man has neither the time, the inclination, nor the means to be his own railway carrier, so that the business would ultimately fall into few hands; and our experience with the express companies show how naturally they would combine, and keep their charges high.

In an address before the Boston Board of Trade, in 1866, Mr. Josiah Quincy urged the purchase by the State of the Boston & Worcester and the Western railroads, and that they should be, by the people for the people. Mr. Quincy has gathered statistics from reliable sources, and shows conclusively that the circulation can be carried on by railroads with a cheapness which, even on the continent of Europe, has not yet been dreamed of, and which at present sounds as strange and as ridiculous as a suggestion for carrying a letter from Maine to California for three cents would have sounded in the days of high postage.

He assumes that the railroads were owned by the State, and the tariff of fares was calculated, not to make an income, but simply to pay the cost of administration, of running, and of keeping the road-beds, the rolling-stock, and the buildings, in repair; then that the roads were worked to their capacity. By an English estimate, the cost of running a train, carrying two or three hundred tons, would be for each mile only sixty-three cents. It seems hardly possible, yet here are the items:—

AVERAGE COST OF CARRYING A TRAIN A MILE.	
	Cents.
Maintenance of way and works.....	11
Locomotive power.....	18
Repairs and renewal of carriages.....	5
General traffic charges.....	18
Rates and taxes.....	5
Compensation for injury and loss.....	1
Legal and parliamentary expenses.....	1
Miscellaneous working expenses not included in the above.....	4
Total.....	63

This estimate is made from the data furnished by the English companies to the Board of Trade, as the account of their average expenses for the year 1863, and is the average of all the railroads in the United Kingdom. Suppose the estimate in the United States should be double this, say \$1.25 a mile, which would make ten cents a hundred miles a fair price. The cost of running a train a hundred miles would be \$125. If a train

carries 200 tons, and we estimate only ten persons to a ton, this makes 2,000 persons who at ten cents each would make \$200, which is \$75 more than the cost. It has been the policy of railroad managers to conceal from the public the secrets of their trade; and it is very hard to get at the facts concerning either the expenses or the profits of railroads. Here, however, we have an estimate given by the railroads themselves in England; and it only needs that the people should become well acquainted with the fact that the railroad can be made to pay its expenses at these rates—ten cents from New York to Philadelphia, fifteen cents from Boston to New York, one dollar and ten cents from Boston to Chicago—in order to have it realized.

The chief objection brought against the control of railroads by the State is a dislike of governmental interference with private business, and a fear, which is perhaps just, of "the administrative ability of government officials." But experience will teach us, if it has not already taught us, that the railway, being essentially a monopoly, should never be entrusted to private hands. The circulation of a country, like the coining of its money, should be carried on by the public for its own convenience and benefit. The continent of Europe has shown that governmental control of the railways is in every way an advantage to the public, and that their management can be so organized as to be at once efficient and economical. If this is so there, why can it not be done here, where the government is really instituted by the people for their own purposes. If it is not possible now, then it simply remains for the people to make it possible. But we have now specimens of public administration which show that it is quite possible to have the railroads managed honestly and well in the public interest. The post-office administration is an instance in point. Its administration might be improved; but its faults come chiefly from the fact that political influences are brought to bear upon it. The management of the railroads should be free from politics, and this could be easily accomplished. The administration of the mint, the constitution of our State boards of education, and other public bodies which are intrusted with public works, will show that it is quite possible to have public interests properly attended to, if the people only demand it earnestly.

The Michigan Railroad Aid Bonds.

The cashier of an Eastern bank, when advised that the payment of interest coupons on the bonds issued in aid of a railroad by a town in Michigan had been stopped, wrote back defiantly, as follows:

"This bank has had much experience in the purchase, redemption, prosecution and recovery of bonds situated like the Port Huron. I beg to refer you to 21 Howard's Reports, 559, Knox County vs. Aspinwall; 1 Wallace's United States Supreme Court Reports, 93, Mercer County vs. Hackett. Both of these cases were our own. Mr. Hackett is our President. We went through years of litigation in the United States Court, incurred great expenses, obtained judgments, and recovered our money from both counties. Knox county was in Indiana and Mercer county was in Pennsylvania. The United States Supreme Court held that bonds that have passed into second or third hands are bills of exchange, and must be paid. I hope that we shall not have to go into the third State. A contest would be hopeless for Michigan; delay, expense, without benefit to any of the parties, would be the fruit of resistance to payment."

This gentleman speaks entirely too confidently. The United States Supreme Court has not decided that bonds passing into second or third hands must be paid, if they never were valid. In the case of Knox county referred to, the objection was not to the unconstitutionality of the act authorizing the issue of the bond, but to the non-compliance with the statute. The court held that the statute had been complied with. In the Pennsylvania case, the point was whether a county, having the legal authority to issue the bonds, could refuse to pay them after selling them into the hands of third parties, upon the ground that the officers of the county had not strictly conformed to the statute.

Neither of these cases presents the point raised on these Michigan bonds. In Indiana, Wisconsin, Iowa, Pennsylvania, and in all the other States where these railroad aid bond cases have been before the courts, the Supreme Courts of the several States had affirmed the constitutionality of the legislation authorizing the issue of the municipal bonds. The question whether that kind of legislation was constitutional was not raised before the United States Supreme Court until the time of the Iowa cases. In Iowa, the Supreme Court of the State had, in a long series of cases, affirmed the constitutionality of the legislation. Subsequently, the Supreme Court of the State reversed all its previous decisions. The several counties in Iowa then refused to pay, and were sued by non-residents in the Federal courts upon the coupons. In *Gelpcke vs. Dubuque*,—1 Wallace, 175,—the Court met the issue of the constitutionality of the legislation by holding that bonds issued and passing into the hands of third parties, after the legislative, executive, and judicial departments of the government had affirmed the constitutionality of the legislation under which they were issued, were binding upon the parties issuing them; that the Supreme Court of the United States would follow and adopt the interpretation of the State Constitution by the State court in all cases arising under it, but, if the State court should change its opinion, then the United States Court would adhere to the first interpretation, so far as it applied to cases arising before the subsequent opinion of the State court. In the case of Michigan, there has never been any decision of the Supreme Court, upon this kind of bonds, but this one. It is the only judicial decision rendered by that court on this kind of legislation. It is, therefore, the interpretation of the State Constitution by the highest tribunal of the State, and how far the Supreme Court of the United States will adopt it may be seen from the following recent decisions:

In *Mercer County vs. Hackett*—1 Wallace—the Court says:

"If this decision of that learned Court (Supreme Court of Pennsylvania) was founded on the construction of the Consti-

tution or statute law of the State, or the peculiar law of Pennsylvania—as to titles to land,—we would have felt bound to follow it."

In *Gelpcke vs. Dubuque* (Iowa case)—1 Wallace—the Court says:

"The sound and true rule is, that if the contract, when made, was valid by the laws of the State, as then expounded by all departments of the government, and administered in its courts of justice, its validity and obligation cannot be impaired by any subsequent action of the Legislature, or decision of its courts, altering the construction of the law. The same principle applies where there is a change of judicial decision as to the constitutional power of the Legislature to enact the law. To this rule, thus enlarged, we adhere. It is the law of this court. To hold otherwise would be as unjust as to hold that rights acquired under a statute must be lost by its repeal."

In *Leffingwell vs. Warren*—3 Black, 599—the Court says:

"The construction given to a State statute by the highest judicial tribunal of such State is regarded as part of the statute, and is as binding upon the courts of the United States as the text itself."

In *Thompson vs. Lee County* (Iowa), the Court, in giving judgment for the bondholders, referring to the opposing decisions of the State Courts, said:

"When these bonds were issued, the courts of that State held that there was no defect of constitutional power, and that the Legislature could lawfully authorize municipal corporations to subscribe to the capital stock of railroad companies. If the bonds in suit had been executed since the last decision in Iowa, they would be controlled by it."

There is no case where the Supreme Court of the United States has undertaken to reverse or override the construction of a State Constitution or State statute by the Supreme Court of such State, unless, as in the Iowa cases, it was to affirm a previous decision of the same court in reference to a contract made before the change of opinion. The decision of the Supreme Court of Michigan is the first, and the authoritative, construction of the State Constitution, and the Supreme Court of the United States, if appealed to, will accept it as the law of the State, binding on that court.—*Chicago Tribune*.

Great Pleasure Excursion.

A pleasure excursion on a mammoth scale has for some time been in contemplation among the great steamboat and railroad men of Cleveland, Detroit, Chicago, and elsewhere, and the arrangements have now been nearly completed for carrying the plan into effect. The original scheme took New York city into the grand circular expedition, which would make a round trip of more than 3,000 miles, but this part of the project has been postponed and the present excursion will be one of nearly 2,000 miles, and will consist of a voyage on Lakes Huron and Superior, on various railroads and the Mississippi river. Mr. J. Disturnell, the author of various works on climatology, traveling guides, etc., has devoted his attention to the organization of this grand pleasure trip, and yesterday concluded contracts with Commodore Davidson, of the Northwestern Union Packet Company, and the officers of the Lake Superior Railroad, which were the only links needed to fill up the circle upon which this expedition proposes to travel. The Cleveland parties will join the excursion at Detroit, after which the line laid out will be as follows:

Point.	Miles.
Detroit to Port Huron.....	75
Port Huron to Sault St. Marie.....	375
Sault St. Marie to Marquette.....	170
Marquette to Duluth.....	400
Duluth to St. Paul.....	150
St. Paul to Dubuque.....	150
Dubuque to Chicago.....	280
Chicago to Detroit.....	188
Total.....	1,908

These figures indicate the distance on regular routes, but various points of interest will be visited on the magnificent shores of Lake Superior and Lake Huron, which will swell the length of the trip to 2,000 miles or over. More than one-half of this travel will be on splendid steamers, on which meals and state-rooms will be furnished without extra charge. The cost of the trip will be only \$45, and purchasers of tickets can join the excursion party at any point on the route, and it is optional with them whether they join the largest party or whether they make the grand rounds in smaller groups. A St. Paul party can, by this arrangement, start over the route by the river or by the Lake Superior road. The Cleveland and Detroit people, however, propose to take their lake trip first, and they will, consequently, reach St. Paul from Duluth, and go home by way of the Mississippi River and the Illinois & Michigan Railroads.

Fourteen splendid steamers are now floating upon the waters of Lake Superior, ten of which are parties to this grand excursion. Five of these steamers run between Chicago and Duluth; five between Cleveland and Duluth; two from Buffalo to Portage Lake, and two from Collingwood to Fort William.

The above is an outline of the trip contemplated, and it will be seen that it is a vast one, passing over the grandest, most picturesque, varied, and healthful portion of the American continent. The weather, too, will probably be all that could be desired, as the circular excursion will probably get under way by the middle of next month, when the heated term will be past, and cool evenings and delightful days, especially on the lakes, will be the general rule. The lake part of the trip will be along the southern shores of Lake Superior, where the scenery is grand beyond description, and where every opportunity will be afforded for enjoying views of the pictured rocks and other natural curiosities, the very thoughts of which are inspiring. To those who wish to vary from the plan laid out, another portion of the distance can be adopted. At Sault St. Marie one of the Canadian steamers can be taken through the Georgian Bay to Collingwood, and thence by rail to Detroit, which would certainly be a novelty in steamboat travel in the Northwest.

Altogether this, it will be seen, is one of the grandest and, in all respects, the most remarkable pleasure trip

ever projected in this country. Those of our citizens who wish to be counted in on this vast movement will probably find further particulars available in a few days.—*St. Paul Press*.

Grand Trunk.

The *Montreal Gazette* gives the following description of the new Pullman sleeping cars which the shops at Montreal are building for the Grand Trunk Railway:

They are nearly completed, and in construction resemble considerably the old style of cars. They possess, however, one very material improvement in two large state rooms. The finish of the car is very much superior to any that we have before seen in Canada. The sides and panels are made of polished black walnut and birch, in one car, while in the other several of the panels are of maple of very beautiful grain. An improvement has also been made in the manner of letting down the berths; instead of the old plan, the upper berth is drawn up and let down with a crank, by means of a chain concealed in the wood work at the top and sides; a silver catch holds the berth in its place when put up for the day. The state rooms, two in number, are divided off from the car by partitions of black walnut. Inside the rooms are about six feet square and are furnished with a mirror, two large easy chairs, and an arrangement, which by day is a sofa, and at night is opened out and made into a bed, in much the same way as that the beds in the body of the car are made; a marble washstand and other toilet conveniences are also provided. Besides the state rooms, there are lavatories fitted up at either end of the car. Ample means of ventilation are provided in an improved ventilator introduced by Mr. Macwood. The stuffs to be used for hangings and for the coverings of the seats of the Pullman cars were the richest of reps in many beautiful patterns. The Pullman car is fifty-seven feet long and about twelve feet wide. When finished, on entering the car one will pass through a narrow passage, on one side of which are two elegant state rooms and a lavatory. Further on are two more state rooms, and the passage then takes a turn, and goes through the centre of the car; here on either side are two compartments, which are parlors by day, and by night become sleeping apartments; at the further end of the car is another state room and another lavatory. The furnishing of the cars will be elegant in the extreme; as an instance of this, they will contain twenty-seven large mirrors. The panelling will be a natural wood varnished, and the panels will, most of them, be bordered with gold. The curtains and other hangings will be of the richest stuffs, and in fact the whole fitting out of the cars will be such as is rarely found, save in the houses of the very wealthy.

Extensions and Improvements out of Income.

Very many American Railway companies have adopted the principle, if it can be so called, of charging capital expenses at a wholesale rate to revenue, resulting in dividend suspension or diminution for a series of years, and in monster dividends afterwards, generally in the shape of stock bonuses. One important American railway company actually, not long back, declared a stock dividend of 80 per cent, representing dividend money for 15 previous years spent on the line! In those 15 previous years the proprietors of the day did not receive the full dividends earned by their line. Their successors (or themselves if they are all alive and still proprietors of the line) suddenly come in afterwards as the recipients of the monster dividend named, and which is more than equal to so much money dividend, the stock being at a premium! What injustice may have been done by this system to one body of proprietors for the benefit of another body in whose time the large dividends in question were not earned! If it is said "Oh, no injustice at all, because the former proprietors had the price of their stock improved by the dividend money having been spent on the line," we answer it is not so; it is exactly the contrary, for the payment of 6 per cent. per annum dividend instead of the 11 or 12 earned, means loss of market price as well as loss of dividend for the time being. The proprietor of the day by this system loses both income and market value for his stock, and both are given over to after proprietors, strangers to him! The injustice of such a course must be apparent. It is not wrong to give a stock dividend to represent the revenue profits spent on the line. That is perfectly correct, but it is unjust to give it to any other than the proprietors during whose time the dividend money in question was earned and applied to capital purposes. In other words, the dividend earned in any year should be paid to the proprietors in due course, in malt or meal, and not to proprietors of a future period; whatever dividend a line fairly earns should be distributed at the usual periods amongst its proprietors.—*Hierapath's Railway Journal*.

—The *Portland Argus* says that a gentleman of Boston, who had taken his seat in the Boston & Maine train for Portland, a few days since, was suddenly impressed that something would happen to the train he was on board of. So strong did this feeling take hold of him, that he left the cars and hastened to the Eastern depot, and took the train there, which came through all safe. So did the other train!

—A commencement has been made with a great telegraphic system in the Argentine Republic. That State has now 836 miles of telegraph in operation, while 1,000 miles are in course of construction. Buenos Ayres and Monte Video are already connected with a cable; another is being laid across the River Parana; and it is intended to connect the Argentine with the Brazilian coast line of telegraphs.

General Railroad News.

OLD AND NEW ROADS.

Intercolonial Railway.

The last three contracts let for this line relate to sections 17, 18, and 19. The contract for section 17 was let to Mr. S. P. Tuck, of St. John's, New Brunswick, 440,000 dollars; that for section 18, to Mr. R. H. M. McGreevy, of Ottawa, for 648,000 dollars; and that for section 19, to Mr. S. P. Tuck, for 395,000 dollars. Mr. Sanford Fleming is now engaged in ascertaining by personal examination the condition of the works. The examination will occupy Mr. Fleming at least a month. The surveys of the whole of line are stated to be now completed.

Vermont Central.

This company has leased and now controls the Vermont & Canada, Sullivan and Ogdensburg roads, having a distance of nearly 500 miles. It intends to lay steel capped rails on a part of the Sullivan road this fall.

Boston, Concord & Montreal.

A branch of this road is to be built to the foot of Mount Washington, 14 miles. There it will connect with the Summit Railroad, and complete connections between the top of Mount Washington and the rest of the world. The extension from Littleton to Northumberland is completed to Lancaster, and ten miles more will complete it to Northumberland, where it will make a junction with the Grand Trunk and give it a short route to Boston. It is proposed to extend the road above Northumberland up the Connecticut River valley to Colebrook, N. H., about 40 miles.

The Erie Stock and the English Proprietors.

The case of Nyce vs. the Erie Railway Company and Heath & Raphael was up again yesterday, in the Supreme Court at Chambers, before Judge Brady, when an important decision was given. Some time ago, an injunction was granted restraining the transfer of certain shares of Erie stock on the company's books to the names of Heath and Raphael. The argument urged for the granting of an injunction was that a conspiracy existed between the stockholders to obtain control of the stock for improper purposes. Judge Brady, upon hearing the motion subsequently made to dissolve the injunction, finally granted the following decision:

"The motion to dissolve the injunction granted on this case was made upon the complaint and answer. It was conceded upon the argument that the injunction was too broad, and it was therefore vacated in such respects as the concession covered. The equities of the complaint are fully denied by the answer, and the charges of unlawful combination and conspiracy refuted. It was not questioned upon the argument that the answer met the allegations of the complaint and denied them fully; but it was contended by the plaintiff's counsel that the verification to the answer not having been made by the defendants, but by this attorney and agent in fact, it was not sufficient to accomplish the same result as if it had been made by the defendants, or one of them. The Code provides that the verification may be made by the agent or attorney, if all the material allegations of the pleading be within his personal knowledge; and it appears, from the statement contained in the affidavit made by the agent, that he possesses the necessary qualifications within the statute. I have carefully examined this case, and entertain no doubt that the injunction should be dissolved."

Ordered accordingly. — *New York Tribune, July 29.*

Missisquoi Railroad.

Work on the line has been commenced. It is to extend from St. Albans, Vt., northwest to Richford, 28 miles, and thence to Clyde, on Memphramagog, whence a new road will connect it with the Grand Trunk at Brighton. Together these roads will form a line across the northern end of Vermont, near the Canada border.

Cape Cod Railroad.

All the stock has been taken for the extension of this road from the present terminus at Orleans north to Wellfleet, about twelve miles. On the line of this extension the peninsula is nowhere more than four miles wide.

Chartiers Valley.

Contracts have been let for the grading and the construction of this road from Pittsburgh to Washington Pa., where it will connect with the Hempfield Railroad which is in operation to Wheeling, W. Va. It will give the Pennsylvania Railroad a branch to the latter place.

Syracuse & Chenango Valley.

According to the *Syracuse Standard* the contractors on this road expected to have the road graded from Syracuse to the canal crossing (about six miles), by the close of this month. A strong force of men is at work near Fayetteville and stone is being drawn for the bridges and culverts along the line. Work has been commenced

on the tunnel in the town of Cazenovia, and along the whole line the contractors are pushing the work forward rapidly.

European & North American.

At the recent annual meeting of the stock holders, in Bangor, the purchase of the Bangor, Oldtown & Milford Railroad was ratified, and the following gentlemen were elected directors: G. K. Jewett, Noah Woods, James W. Emery, Arad Thompson, Gideon Mayo, Charles P. Stetson, M. S. Drummond, William Flowers, and Samuel F. Hersey.

Rhinbeck & Connecticut.

This company proposes to build a line through Dutchess county, N. Y., which will connect the Connecticut Western with the Hudson River at Roundout where the Delaware & Hudson Canal Company will deliver its coal.

Burlington, Cedar Rapids & Minnesota.

A correspondent writes to us from Cedar Rapids that the above road is being pushed forward rapidly to that point. The bridge is well under way, and the cars will doubtless run from Burlington to Cedar Rapids some time next month. Northwest of Cedar Rapids the location of the line is fixed as far as Waterloo. Beyond that nothing is settled, but our correspondent says:

"It has been thought that the road would go thence to Mason City and Mankato direct, but I understand a change of programme is contemplated which will take the road farther west, striking the head waters of the Blue Earth River, and running thence north to Mankato via Blue Earth River. The building of the Iowa Central to Mason City seems to render this change necessary. I understand that in a few days the solicitor and a director of the company will go north to look the ground over."

Brunswick & Albany.

Trains are now running from Brunswick to a point 80 miles west, about 35 miles beyond the crossing of the Atlantic & Gulf road.

East Alabama & Cincinnati.

This company was formerly known as the Ensfaula, Opelika & Guntersville. It proposes to construct a railroad from Ensfaula, Ala., northwest near the eastern boundary of the State through Opelika, Jacksonville or Oxford, to Gadsden, where it will connect with the Alabama & Chattanooga Railroad for Chattanooga and Cincinnati. It may be continued northward through Centerville to Nashville.

Springfield & St. Louis.

The township of Springfield on the 26th inst., voted in favor of subscribing \$50,000 to this road, on condition that the shops be established at Springfield.

Kansas City & Memphis.

The County Court of Bates county, Missouri, decided to make a subscription to the Kansas City & Memphis Railroad. On being informed of this, Francis Rodman, the Secretary of State of Missouri, wrote to the Clerk of the County Court that the articles of association of that company were not on file in his office and that there was nothing to show that it was duly incorporated. Hereupon it was quite generally reported by enemies of the company that it had no legal existence and the Bates County Court rescinded its order for a subscription. Hearing of this the Secretary of the company searched its records and found a letter from Secretary of State Rodman acknowledging the receipt of the articles of incorporation and saying that they were placed on file on the 24th of November 1869. Upon examination the Secretary of State discovered that the company's papers were really on file, and corrected his mistake by sending certified copies to the County Court of Bates county.

Mr. Williams, Secretary of the company, writes to the *Kansas City Bulletin* as follows:

"I would here state another point. On the consolidation of the Cameron & Kansas City Railroad with the Hannibal & St. Joseph Railroad, it was thought best, if not necessary, by some of our Board of Directors, including President Richardson, that the same powers, rights, privileges and franchises granted by the Kansas City & Cameron Railroad Company should be granted by the Hannibal & St. Joseph Railroad Company to our Company, and that the acts of the Cameron Railroad Company be confirmed by the latter company. This has been done by the Hannibal & St. Joseph Railroad, and every right and power asked for by our company fully and freely granted."

Great Western Air Line.

The company is advertising to let contracts for grading between Glencoe and Canfield and it will have the work under way in a very short time.

Evansville & Indianapolis Air Line.

Francis Fallows, of New Haven, Conn., President of this company, says that the refusal of the injunction to prohibit the Mayor of Evansville from issuing the \$300,000 to aid in the construction of the road, removes the

last obstacle in the way to a speedy completion of the road. It will be built under the old charter granted to Olliver H. Smith some fifteen years ago. The work will be commenced as soon as the proper materials can be procured and laborers transported.

Rockford, Rock Island & St. Louis.

The town of Sterling votes to-day on the question of subscribing to the company \$50,000 to aid in bridging Rock River at Sterling. The bridge is also to serve as a highway bridge and must be completed by the first of April, 1871.

Lawrence & Pleasant Hill.

Work has been suspended on this road, which the Missouri Pacific had leased and was expected to construct a shorter connection with the Kansas Pacific.

Wakarusa Valley.

At a late mass meeting of Kansas citizens along the route of this proposed road it was resolved: "That it is of the highest importance to Douglas county in general, and Lawrence in particular, to secure the location of a railroad in a southwesterly direction, so as to best secure the greatest amount of trade and commerce of the great and rapidly growing Southwest, as well as direct across the coal mines." Also: "That we are in favor of an air line route from Lawrence to Burlington, game, as near as practicable."

American & Mexican.

The American & Mexican Railroad and Telegraph Company, which has its office on the corner of Broadway and Rector streets, New York, publishes a prospectus, setting forth in glowing terms the advantages of the road which it proposes to construct from a point near El Paso, Mexico, (near the northwest corner of Texas and a few miles south of the thirty-second parallel), west through the Mexican States of Chihuahua and Sonora about 290 miles to Santa Cruz, a town of Sonora six miles south of the Arizona line, and thence south 200 miles through Hermosilla to Guaymas, a port on the Gulf of California on the 28th parallel. It is proposed to construct the section from Guaymas northward first. That part of the line is fully surveyed. From Santa Cruz a connection with the Kansas roads might be made through Arizona and New Mexico.

Ottawa, Oswego & Fox River Valley.

Avoca township, in Livingston county, on the 26th inst., voted \$12,000 to the extension of this road from Streator to Fairbury. The contracts for construction will be let as soon as a difficulty which has arisen concerning the Fairbury bonds is settled. From Streator to Fairbury is about thirty-two miles, and at the latter place connections will be secured with the Toledo, Peoria & Warsaw Railway. It is intended ultimately to extend the line southeast through Ford and Champaign counties.

Hastings & Dakota.

It is now reported that the negotiations for the sale of this road to the Milwaukee & St. Paul Company were at length consummated in New York city a few days since. The sale includes the land grant in aid of its construction, and the transfer took place August 1. General Le Duc, President of the Hastings & Dakota Company, retains a connection with the operation of the road under the new regime.

Mankato & New Ulm.

Articles of incorporation of a railroad with this name have been adopted and filed by John F. Tracy, George L. Dunlap, John B. Turner, and Henry H. Porter, of Chicago, and James H. Stewart, of Winona, Minn. The first article says: "The nature of its business is the construction, maintenance and operation of a line of railway with single or double track, with all necessary side tracks and turnouts and appurtenances from the point of junction with the Winona & St. Peter Railroad, in the town of Lime, county of Blue Earth, Minn., through the city of Mankato, Blue Earth county, to a point in or near the town of New Ulm, in the county of Brown, Minn., and its principal place of business in Mankato, Blue Earth county, Minnesota."

Ocmulgee & North Georgia.

This road, according to the *Macon Journal*, is intended to run from Macon northward with the course of the Ocmulgee, and through the northeastern portion of Georgia to whatever point may be selected by the Cincinnati people for the terminus of the great Southern route through Eastern Kentucky and Tennessee. The surveys are progressing rapidly, and \$5,000,000 stock has been secured without State or county aid.

Port Royal & Augusta.

Work on this new South Carolina road has been suspended, the hands having struck in consequence of contractors failing to pay them. Over two hundred employes came to Augusta on the 29th ult. from South Carolina, in very destitute circumstances, clamoring for bread. Rations were supplied by the officers of the road.

—E. D. L. Sweet, well known in Chicago an accomplished electrician, lately General Superintendent of the Atlantic & Pacific Telegraph in this city, has been appointed General Manager of the Franklin Telegraph. James G. Smith retains his position as Superintendent of the Franklin Telegraph.

—Judge Gray, of the Supreme Court of Massachusetts, on the 2d inst. appointed the following persons as Receivers of the Hartford & Erie Railroad, taking bonds from each in the sum of fifty thousand dollars: James W. Converse, J. Otis Norcross, Thos. W. Pierce, of Boston; Geo. Oliphant, of New York; and Geo. M. Bartholomew, of Hartford.

—Q. P. Lewis succeeds Alexander Humphreys as Auditor of the Cincinnati & Indianapolis Junction and the Fort Wayne, Muncie & Cincinnati railroads.

—A. Shaw is appointed General Passenger Agent of the Selma, Rome & Dalton Railroad with headquarters at Patona, Ala.

—Recent changes have been made in the officers of the Selma & Meridian Railroad. John Hardy succeeds Campbell Wallace as Receiver; P. D. Barker takes the place of John M. Bridges as Secretary and Treasurer; W. R. Bill of C. B. Wallace as General Superintendent; and R. S. Steadman of S. K. Phillips as General Freight and Ticket Agent.

—William Martin has accepted an appointment as General Freight Agent of the Union Pacific Railroad. The *Official Railway Guide* says of him: "It is needless to state, in this connection, that Mr. Martin is 'perhaps better qualified than any other person, from his ripe experience in freight matters, to command for the Union Pacific Railroad that respect to which it is 'entitled as the great transcontinental highway of traffic. 'It is evident that the General Superintendent is 'rounding himself with executive officers of the very 'highest order,—men who will render his administration alike popular and remunerative."

—S. W. Scott has been appointed General Passenger and Traveling Agent for the Southern Railroad Association, which operates the New Orleans, Jackson & Northern and the Mississippi Central railroads. His headquarters are at the corner of Camp and Common streets, New Orleans.

—The Springfield & St. Louis Railroad Company organized on the 4th inst. by electing the following officers: President S. H. Melvin, of Springfield; Vice President, Robert McWilliams, Litchfield; Secretary, P. B. Updyke, Litchfield.

—At a meeting of the stockholders of the Sioux City & Pacific Railroad Company, held in Cedar Rapids on the 3d inst., the following gentlemen were elected Directors: John I. Blair, D. C. Blair, Blairtown, New Jersey; W. F. Glidden, Oakes Ames, F. Nickerson, Boston; W. W. Walker, Chas. E. Walker, Geo. Douglas, Cedar Rapids; J. H. Scranton, Scranton, Pa. All were members of the old board except Chas. E. Walker and Geo. Douglas, who succeeded Wm. B. Allison and Perry H. Smith.

TRAFFIC AND EARNINGS.

—At a meeting of the Transportation Committee of the Cincinnati Board of Trade, Mr. McNeale submitted a report in reference to rates to Southern points during the close of the Louisville Canal. He thinks all difficulty concerning overcharges will be obviated, and says the General Freight Agent of the Indianapolis & Cincinnati Railroad has made a schedule on which all lower river boats agree to prorate. Connecting steamers agree that the Indianapolis & Cincinnati Railroad may guarantee rates, and give through bills of lading.

—The traffic of the Grand Trunk Railway, 1,377 miles long, for the week ending July 2, was as follows:

1870.....	\$295,000
1869.....	36,420
Increase (9% per cent.).....	\$258,580
And for the week ending July 2:	
1870.....	\$225,700
1869.....	29,150
Increase (1 1/2% per cent.).....	\$196,550

PERSONAL.

—Attention is directed to the advertisement of a telegrapher in another column. We are assured by parties who are intimately acquainted with the gentleman, that he is a scientific electrician, a telegrapher of rare skill, and a manager whose integrity, accomplishments, and executive ability, would make him very valuable to any company which might engage him.

—General Robert E. Lee, it is said, will accept the Presidency of the Virginia Valley Railroad (Harper's Ferry to Salem, Va.) provided the trustees of Washington College, of which he is President, will give their consent. This is the railroad which the Baltimore &

Ohio Company is building, and a rival of the Shenandoah Valley Railroad, which the Pennsylvania Company is to build parallel and quite near.

—H. G. Hutchinson, engineer of the California & Oregon Railroad, was drowned on the 21st ult., while endeavoring to run a surveyor's line across the Sacramento, near the mouth of Pitt River.

MISCELLANEOUS.

—In order to encourage traffic to and from Europe via the Suez Canal, the administration of the Messageries Imperiales introduced a fresh passenger classification last month. Under the new system, the company will carry four distinct classes of passengers, three at very reduced rates.

—It is proposed to construct a railroad along the Tar River in North Carolina, upon the plan of the Welsh narrow-gauge road, with rails not more than thirty inches apart.

—It appears that the Brighton Railway Company of England this half-year have expended an additional amount of £23,700 on account of the New-Cross accident, and that but for this circumstance they would have been enabled within a sum of £1,900 to pay the interest on the whole of their preference stocks.

—The cost of rolling stock in England may be inferred from the price for which the Great Eastern Company contracted for twenty freight locomotives ("goods engines") of a Manchester firm, which was £2,250 each, or about \$13,500 in United States currency, at the present price of gold.

—At Leroy, Minn., one hot day this summer, a switch had been opened for the purpose of letting in a freight train, and when it became necessary to change the switch back to the main track the rails had expanded so much by the action of the sun's rays that it could not be done. Cold water was poured upon several sections of the track, cooling off the iron and allowing the switch to be shut.

—Hon. B. Gratz Brown, of Iron county, Missouri, is building a railroad from Iron Mountain to his Granite Quarry, 6 miles west, to facilitate the shipment to the St. Louis bridge.

—The track layers at both ends of the fifty mile gap in the Kansas Pacific Railroad are rapidly shortening it up. In one day last week fifteen miles of track were laid. There is no reason to doubt, what has heretofore been announced, that the line will be finished by the 15th inst. and ready for through business by the 1st of September.

—Track laying will be begun on the Louisiana & Missouri River Railroad about the 1st of September, from Louisiana, Mo., to Mexico, Audrian county, about fifty miles.

—Of fifteen hundred Chinese laborers engaged to work on the Alabama & Chattanooga Railroad, nearly all have been in the country over ten years, and were engaged in the construction of the Central Pacific road. Five hundred of the number have arrived at Chattanooga and are at work.

—The Burlington *Hankeys* of the 26th ult. says: "We have already published the particulars of the absconding of Armstrong, a sub-contractor on the Chicago & Southwestern Railway. The hands were left unpaid and very much exasperated. On Friday about 100 of these hands met the principal contractors, Messrs Snell & Aiken, at the Ashland crossing on the Des Moines Valley road, and took them prisoners, refusing to let them go until they paid what was due them from Armstrong. They finally let Mr. Snell go to Fairfield to try and obtain money for them. Soon after the Sheriff of Wapello county and the Marshal of Ottumwa appeared on the ground, but did not think it advisable to attempt the rescue of Aiken, and the men were resolute in their determination to hold him, and threatened to hang him should Mr. Snell return without the money to pay them. The next day the Sheriff returned with a posse, and the mob concluded to let Mr. Aiken slide. We have no accounts of any arrests being made."

—Governor Austin, of Minnesota, does not seem to be fond of railroad managers. A Minnesota paper reports a passage in the Governor's speech at Owatonna, as follows: "We should seize them (the railroad managers) by the foretop, and shake them over hell till they get a smell of their manifest destiny."

—Col. Wm. P. Craighill, of the United States Engineer Corps, has gone to Virginia to ascertain the practicability of extending the James River Canal to a connection with the Ohio, and of deepening the old canal, which now extends to Covington, close to the West Virginia line.

—The Legislature of Tennessee has passed a resolution tendering the use of the hall of the House of Rep-

resentatives in the capitol for the use of Grand International Brotherhood of Locomotive Engineers at the annual meeting to be held in Nashville on the 19th of October next.

—Five hundred Chinamen have been engaged to complete the Lewis tunnel, near White Sulphur Springs, on the Chesapeake & Ohio Railroad. The negroes do not like it.

Locomotive Work on the Fast Pennsylvania Train.

A correspondent of the *Locomotive Engineers' Journal* gives a biography of Henry Hall, who has been a locomotive engineer since 1885, all the time running on the lines which now form the Pennsylvania Railroad, and nearly all the time between Philadelphia and Harrisburg, where he is still. The first trip of the fast train was made by him, and is described by the correspondent as follows:

On the first day of May, 1870, the company issued a new schedule, making the time of the Pacific express east from Pittsburgh to Philadelphia, in eleven hours and fifty-five minutes, and the trains were to make but two stops from Pittsburgh to Philadelphia, first one at Altoona, and then Harrisburg, and from there to Philadelphia: the whole distance being some 356 miles. The train from the West came to Harrisburg on time; both Western and Middle Division making the runs through without taking water with four cars, the length of the Middle is 132 miles. Now comes the turn of our veteran to try an experiment never tried before, between Harrisburg and Philadelphia. Conductor Gronos gives the signal and trains move off with Bro. Henry Hull at the throttle. The city of Lancaster is reached, a distance of 37 miles, and the train passes on without stopping, for the first time, which so astonished the inhabitants, that they have scarcely recovered from the shock. Parkersburg on time, 62 miles; Downingtown on time, and passes on without taking water. Distance from Harrisburg 74 miles. Now comes the tug of war. Will he make it with Byer's grade against him of twelve long miles? They anxiously await his arrival at Paoli, the first telegraph station after you ascend the grade; click, click, click, says the instrument. Pacific express east, on time; 21 miles further yet to Philadelphia, and at 2:45 p. m. engine 332 with Pacific express, Bro. Henry Hull engineer, stops on time in West Philadelphia depot, having made the first run ever made from Harrisburg to Philadelphia without stopping a wheel.

The next trip east on the 3d of May, he made the run again with five cars. The annexed statement shows the amount of coal per mile used, also the amount of water.

Engine 332 consumed in running over the distance of 106 miles, 2,400 gallons of water and 20 bushels of coal; or 22 34-53 gallons of water per mile, and 15 5-53 pounds of coal per mile. The engine is a Baldwin build; cylinder 17x24; driver 5 1/2 foot.

In writing this article, we have no desire to boast, but we think that we can say, that the runs which are now daily being made on the Pennsylvania Central, are the greatest that have ever been accomplished, either in this country or in Europe. To travel over one hundred miles with one tank of water, with one car, would have been considered almost impossible. But in this instance we see that impossibilities have come to be a thing of the past.

Validity of Nebraska Railroad Bonds.

A correspondent of the *Omaha Republican* calls attention to the fact that two or three judges of the Supreme Court of Nebraska have delivered decisions affirming the validity of bonds issued by towns and counties of that State in aid of railroads. His letter is as follows:

A very important case has just been disposed of before Chief Justice Mason of this State.

The question presented is one in which the people of this city and of other parts of the State, are very much interested. Robert Hawk et al. brought suit against the County Commissioners of Otoe county to restrain them from levying and collecting a tax to pay the interest on the bonds issued by Otoe county to aid in the construction of the Burlington & Missouri River Railroad.

The injunction was allowed, but the application was dismissed. The question of restraining County Commissioners from the further issuing of bonds for railroad purposes, and from levying and collecting taxes to pay the same, may now be regarded as at rest.

Judge Crouse passed upon the same question in May last, and Judge Mason on the 18th inst.

Judge Crouse, in an elaborate opinion denied the injunction prayed for, and the case before him was also dismissed.

The Nebraska City case involved the same question raised in the case before Judge Crouse, and as two of the three judges have passed upon the question involved in the same way, we may reasonably infer that the controversy over such questions has been definitely and finally settled. Our railroad companies can now proceed with their work with some degree of certainty. They have the assurance that repudiation will not be sanctioned nor countenanced by the courts.

Neither Judge Mason nor Judge Crouse will aid in their official capacity or otherwise the dishonorable attempts of repudiators in any quarter of the State. They have made for themselves in this matter an honorable record, and we feel safe in predicting that they will adhere to it.

Judge Lake has not yet been called upon (so far as we are advised) to decide the question referred to, but we have reason to believe that he will not differ from his learned brethren of the bench. On the whole we can say to railroad men, push on the work, for the courts, as well as the people are with you.



PUBLISHED EVERY SATURDAY.

CONTENTS.

Page.	Page.
Gravitating Wire Rope Tramways.....433	SELECTIONS.
CONTRIBUTIONS.	Need Railroad Traveling be Dirty?.....445
The Use of Iron in Permanent Way, by Wm. S. Huntington.....433	Fast Trains.....445
SELECTIONS.	GENERAL RAILROAD NEWS.
The London Underground Railway.....434	Old and New Roads.....439
Proposed Paris Metropolitan Railroad.....434	Locomotive Statistics.....440
Chicago, Burlington & Quincy Report.....435	Elections & Appointments.....440
The Michigan Railroad Bonds.....436	Traffic and Earnings.....441
Railroads in England and United States.....437	Personal.....441
Michigan Railroad Aid Bonds.....438	Miscellaneous.....441
Great Pleasure Excursion.....438	Register of Earnings.....443
Grand Trunk.....438	Mechanics and Engineering.....444
Extensions and Improvements out of Income.....438	EDITORIALS.
Locomotive Work on the East Penn. Trains.....441	Government Operation of Railroads.....443
Vitality of the Nebraska Railroad Bonds.....441	The Chicago, Burlington & Quincy Report.....443
	Kansas and Texas.....443
	Advertising.....443
	The Indiana Railroad Aid Law.....443
	NEW PUBLICATIONS.....443
	CHICAGO RAILROAD NEWS.....443

Editorial Announcements.

Correspondence.—We cordially invite the co-operation of the Railroad Public in affording us the material for a thorough and worthy Railroad paper. Railroad news, annual reports, notices of appointments, resignations, etc., and information concerning improvements will be gratefully received. We make it our business to inform the public concerning the progress of new lines, and are always glad to receive news of them.

Articles.—We desire articles relating to railroads, and, if acceptable, will pay liberally for them. Articles concerning railroad management, engineering, rolling stock and machinery, by men practically acquainted with these subjects, are especially desired.

Inventions.—Those who wish to make their inventions known to railroad men can have them fully described in the RAILROAD GAZETTE, if not previously published, FREE OF CHARGE. They are invited to send us drawings or models and specifications. When engravings are necessary the inventor is expected to furnish his own engravings or to pay for them.

Our Prospectus and Business Notices will be found on the last page.

GOVERNMENT OPERATION OF RAILROADS.

We copy in this number of the RAILROAD GAZETTE an article entitled "Railroads in Europe and the United States," which appeared in that interesting department of the *Old and New* magazine called the "Record of Progress."

The author of this article, Mr. Edward Howland, believes that all railroads should be the property of the nation, managed and operated for the public benefit. In this way, Mr. Howland affirms, the cost of transportation can be reduced to a fraction of the rates prevailing in this country. To establish the truth of this statement he gives figures taken from some English document, by which it appears that expenses per train mile in England in 1863 amounted to 63 cents. Instead of resorting to the statistics of American railroads in 1870 to show the cost of moving trains in this country at the present time, he calculates that cost by doubling the above figures a very simple if not satisfactory process. Thence he ascertains that passengers can be transported 100 miles at ten cents each! Consequently he announces that railroads charging passengers ten cents from New York to Philadelphia, fifteen cents from New York to Boston, and a dollar and ten cents from Boston to Chicago would pay their expenses. In this case the average cost per train per mile is assumed to be the same as the cost of a passenger train per mile. We could hope that some railroad might be lent to Mr. Howland, and he induced to operate it until he had learned the difference. At this time the transportation of an ordinary man shipped as freight to Boston would be something like 75 cents. To be sure the companies lose money by every shipment at that rate, but we think that at double the rate—perhaps even at \$1.10—the companies would be able to pay their expenses by transporting men with freight accommodations (18,000 pounds per car load), *provided they could be sure of a large and steady business.* But as in that way one line could move something like 50,000 men per day each way, a large part of the population would have to spend their time in traveling, just to keep the roads employed.

Just here is one of the fallacies of Mr. Howland. There is a limit to the business of transportation. Freight will not be shipped for amusement, however low the rates. At the present time and for some weeks the lines to New York have been carrying to Chicago at rates which, on the lower classes at least, will not pay

the operating expenses, to say nothing of interest on capital invested. But do we see immense shipments of coal, stone, etc., and the railroads unable to provide cars for the freight offering? Nothing of the sort. There is probably a heavier movement than there would be with higher rates, and merchants are anxious to take advantage of the low tariff. But it is remarkable that they will not on that account anticipate their purchases of fall stocks by even three or four weeks.

The standing example of those who argue in favor of government control of railroads is Belgium, where transportation is cheaper, perhaps, than in any other country. But in many particulars affecting the cost of transportation Belgium is the opposite of the United States. It has the densest population in the world; it is a hive of industry, and many of its manufactures are of heavy goods which give an enormous traffic to its short lines of railroad. In an area one-fifth as large as Illinois it has double the population of that State. The United States has 63½ square miles of territory to one mile of railroad, Belgium but 6½ square miles. Yet Belgium has 2,901 inhabitants per mile of road and the United States but 811. A much larger part of the transportation needed by the 2,901 people on a mile of Belgian road is done by rail than of that needed by the 811 on a mile of road in the United States. An internal navigation system of many thousands of miles of lake and river divides the business with the railroads. It is entirely impossible for our railroads to do as much business as the Belgian roads, simply because there is not so much for them to do. When the business of the country increases so as to give cargoes for trains moving fifteen minutes apart, then, doubtless, rates can be much reduced.

In all the arguments and estimates made in the paper referred to, it is assumed that the earnings shall be made to pay only the operating expenses, and that nothing shall be allowed for interest on capital. If the Government should buy and pay for the roads, this would be very well. But we imagine that this purchase could hardly be made out of the surplus revenues of the country in one year or five. Their aggregate cost is just about as great as the amount of the national debt. If money is raised by the issue of bonds for the purpose, then the interest on the bonds must be paid; which is only another way of saying that the country would have to pay the interest on the capital invested in railroads.

We will not say that the present system is perfect or that it is impossible to make any regulations or restrictions on railroad business; but certainly we cannot look to the Government for reforms in railroad administration and operation, until there has been an immense improvement in its administration of its own affairs. It is notorious that it costs the Government very much more—often two or three times as much—to have work done poorly as it costs individuals and corporations to have it done well.

Something the Government can do. It can give stockholders control of their investments, defend them from the highwaymen who so often seize and dispose of their property, and thus give confidence to investors. This will induce them to furnish a capital for a low rate of interest, because it is sure. Just laws faithfully executed would have relieved the people of the United States of from one to three per cent. of the interest now paid on capital invested in railroads. When our courts are all pure, and our administration of the revenue laws effective and inexpensive, then, perhaps, it will not be impossible, though probably it will be unadvisable, for the Government to own and operate the railroads.

THE CHICAGO, BURLINGTON & QUINCY REPORT.

We give in this number, at considerable length, the report of the above company for the year ending April 30 last. This road is one of the best railroad properties in existence. For many years it has been in admirable condition, with full and efficient equipment, and has been under one general management, universally acknowledged to be able and economical. Its business, therefore, has been a trustworthy index of the business of the company on its line in a much greater degree than that of some other roads, whose managers one year are intent upon improvements and extensions, another upon dividends; now liberal if not careless in expenditures, and again severely economical. The policy of the Chicago, Burlington & Quincy has not been variable, and we know that every year it has done its best; so the report of the year's operations is always instructive.

The report for the past year is an additional proof of the falling off in business during that year. The average length of road in operation was 532½ miles, against 409½ miles the previous year; yet with this increase of mileage of 30 per cent., the receipts were less by \$191,036.06, or 2½ per cent. Moreover the addition of road

owned by the company does not represent all its new tributaries. New railroads in Iowa and Kansas have added even more largely to the mileage which contributes to its through business. The increase in earnings from the Hannibal & St. Joseph Railroad alone was \$384,000. Consequently there must have been a very serious decrease in local business. This is very well explained by Mr. Joy, who attributes the decrease to the failure of the corn crop, the chief product of the country on the lines of this road, contributing directly its largest item of freight, and indirectly greatly affecting other exports and many imports. The people on the road have been unusually poor during the past year. They raised little, sold little, and bought little, and consequently the earnings of the road were greatly affected.

Although the traffic of the road in many particulars was unusually poor, in others it was extraordinarily good, and especially so in Kansas business. Indeed, the passenger business shows an increase of nearly \$60,000, and we suppose that this increase is owing almost entirely to the immense immigration to Kansas, of which this road has had the largest share. There are more reasons than one for being satisfied with this immigration. Not only has it added materially to the income of the road during the past year (when it was especially welcome), but it is sure to add yet more to it hereafter. Every settler carried to Kansas becomes a permanent contributor to the income of the road. The same may be said of the Burlington & Missouri line and its Nebraska extension, which give access to a new country very attractive, and sure to be occupied soon and to furnish a heavy traffic, a large share of which will pass over the Chicago, Burlington & Quincy road. The immigration is shown very clearly by the freight returns. While the Chicago business of the entire line shows one-sixth more pounds moved eastward than westward, the amount delivered to the Hannibal & St. Joseph road was more than 2½ times as great as that received from it, and on the Cameron & Kansas City road, the chief highway for immigrants, nearly six times more was moved westward than eastward. This shows that the freights moved by these roads have been supplies for immigrants rather than the produce of the country. Another year or two will show the balance on the other side, and the total traffic very much increased.

The proportion of expenses to earnings is naturally greater when the earnings are decreased and the mileage increased. With an aggregate mileage 30 per cent. greater, the expenses have been greater by only 9¼ per cent. The ratio of expenses to earnings was 60.27 per cent., while the previous year it was but 53.58 per cent.

Mr. Joy announces that he is in favor of giving aid to roads which are likely to be built in sections near the company's lines and adopting them as auxiliaries, instead of discouraging them and thus inducing them to make connections with rival lines. At this time it is comparatively easy to obtain means for the construction of a railroad, and districts of any considerable extent will not remain without one. When this is the case, the question with this company is no longer whether it will choose to have such a road constructed, but whether it will prefer to have it a friend or an enemy. Under the policy indicated by Mr. Joy we may expect that new branches will in time be added to the already extensive system of the company. It now occupies most of the territory in Illinois west of the Illinois River and south of Rock Island, and beyond the Mississippi no road can compare with it in the extent and value of its direct connections—roads controlled by the same body of capitalists. These reach directly to the Union Pacific and the Kansas Pacific, they stretch along the valley of the Missouri between these two roads, they reach southward to the Indian Territory and afford the best outlet to the most rapidly growing part of Kansas. In a few weeks cars will be able to run through from Chicago to Denver and Cheyenne, and even to the Pacific, by way of this company's line to Kansas City, and by this line only, it having the only completed bridge over the Missouri. The extensions of its Iowa connection to various points in Nebraska and for a considerable distance into that State, already effected, will secure to it the largest share of the traffic of that part of the State south of the Platte. And the vast through business which trans-Mississippi and trans-Missouri lines are sure to bring it will benefit the country along its line quite as much as the stockholders; for as the through earnings increase, the local rates can be and will be decreased; and the traffic of Kansas, Nebraska and the West will benefit materially the citizens of Illinois.

—The Duluth city council has voted \$50,000 bonds to the Lake Superior & Mississippi Railroad Company for money expended by the company on the breakwater and improvements of the lake and bay.

Kansas and Texas.

The decision of the authorities at Washington is that the Missouri, Kansas & Texas Railway (Junction City to Chetopa) has the sole right to build a railroad across the Indian Territory. The Missouri River, Fort Scott & Gulf road claimed this right, and its managers still claim that the decision, which was by executive and not by judicial officers, was contrary to all law. Under the circumstances they have three alternatives: They can reach Texas by constructing a road within the State of Arkansas, close to the border of the Territory, and that by diverging eastward from the present terminus only three or four miles; they can reach Northwestern Texas and the cattle trade by extending the Kansas City & Santa Fe Railroad, soon to be completed from Olathe to Ottawa, southwest, reaching Texas about the 100th meridian; or they can go on with the construction of their line from Baxter to Preston, through the Territory, notwithstanding the decision of the administration. In case the latter step should be decided upon, the extension could be prevented only by a judicial decision, and the managers of the Fort Scott line are ready and anxious for an appeal to the courts, believing that these would acknowledge their claims.

The construction of the Santa Fe road would secure a heavier cattle trade than almost any other policy, perhaps; but it would necessitate a large expenditure in a country yet to be developed, and yet would not give the connection with the Gulf which is sought by the Fort Scott line. To construct the line through Arkansas would make necessary heavier work than on the Territory line, and the entrance into Texas would be made more than a hundred miles east of the intended point, so that the connection with the Texas roads would be made less directly.

The one thing certain is that the managers of the Fort Scott road will in some way complete their connections with Texas.

Advertising.

Those who observe the advertising columns of English engineering and railroad journals cannot fail to notice how generally these columns are used to make known the wants of companies and individuals. It is the custom of companies to advertise for tenders for the supply of all their material, much as companies here advertise for bids for grading and other construction. We have before us the advertisement of a company calling for tenders for the supply of 96,500 tons of coal of different kinds, to be delivered within twelve months, and a similar advertisement for contracts for clothing and hats and caps, for its uniformed employees. The companies advertise for bids for what they want, and, it is to be presumed, are pretty sure to have offers at the lowest possible prices. It is hardly possible that the most industrious and upright purchasing agent will always find the best market for his purchases, or even that manufacturers and dealers will make as good terms in answer to his application as they would to an advertisement addressed to all the world.

Another noticeable feature in these advertisements is the number of applications for employees of high grades. There are frequently applications for engineers, locomotive superintendents, general freight agents, etc. This, of course, is not owing to any lack of such services. It is much more easy to fill such situations there than here, or rather, it is much harder to obtain such situations there than here. But by advertising the situations a competition is secured, and the company is able to secure the very best talent the position will command. We see now in the English periodicals an advertisement for a chief engineer at a salary of £1,200. Such a place, of course, it is easy to fill without advertising; but by advertising a large number of applications will be received, and the company will be able to select the best.

Companies, also, as well as manufacturers, are accustomed to advertise any locomotives, cars, tools, or other supplies, which they may have to sell. Thus, with the advertisements of persons seeking situations, the advertising sheets of the technical journal become a general exchange, quite as interesting as the text. It is hardly doubtful that this custom might be introduced into this country to advantage, and that advertisements of wants, sales, etc., would save much time, trouble and expense to all parties concerned.

The Indiana Railroad Aid Law.

The example of Michigan seems to be infectious. A case has recently been tried at Lafayette, Ind., by Judge Larne, of the Court of Common Pleas of Tippecanoe county, involving the validity of a subscription of \$373,000 voted by the county of Tippecanoe, in aid of the Lafayette, Bloomington & Muncie Railroad. A special tax had been levied for one-half of that amount, when an

injunction was asked of the court to prohibit the collection of the tax. The decision of the court, rendered on the 1st inst., is that the law authorizing subscriptions conflicts with a section of the constitution, which says: "No county shall subscribe for stock in any incorporated company unless the same shall be paid for at the time of said subscription; nor shall any county loan its credit to any incorporated company, nor borrow money for the purpose of taking stock in any such company."

An appeal will be taken to the Supreme Court, whose decision will be looked for with great interest; for the matter is of great importance. Indiana has been second only to Illinois in its readiness to vote aid to new railroad projects.

REGISTER OF EARNINGS.

FOR THE THIRD WEEK IN JULY.

Chicago & Northwestern (1,157 miles) 1869	\$353,573
" (1,157 miles) 1870	344,536
Decrease (8.1 per cent.)	\$9,037
Chicago, Rock Island & Pacific (608 miles) 1870	\$116,000
" (594 miles) 1869	108,364
Increase (12.8 per cent.)	\$7,636
Milwaukee & St. Paul, (536 miles) 1870	\$143,200
" (525 miles) 1869	140,355
Increase (2.1 per cent.)	\$2,845
Pacific of Missouri, (335 miles) 1870	\$50,700
" (335 miles) 1869	46,100
Increase (11 per cent.)	\$4,600
St. Louis & Iron Mountain, (310 miles) 1870	\$30,430
" (310 miles) 1869	28,561
Increase (6.4 per cent.)	\$1,869
Toledo, Wabash & Western, (523 miles) 1870	\$68,843
" (523 ") 1869	59,748
Increase (15.2 per cent.)	\$9,095

NEW PUBLICATIONS.

The *Travelers' Official Railway Guide* for August is on hand promptly, crowded with corrected time tables and railroad maps. The progress made by this guide within a few months past has been almost unexampled. It is now a large octavo of more than 250 pages about as large as those of *Appleton's Journal*, is handsomely printed, has nearly fifty railroad maps, many of them large and elaborate, and is as accurate as a guide can easily be made by skill and industrious editing and the universal co-operation of railroad men, who forward their time tables as soon as they are made. Travelers could hardly wish for anything better, for it is complete, accurate and clear. A large amount of valuable railroad news is given with each number. We call attention especially to an article entitled "Railroad Management," which we have copied in this number of the GAZETTE. The editor's experience makes his opinions on the subject discussed unusually valuable.

Chicago Business Directory.—This year, for the first time, Chicago has a business directory. For this one we are indebted to the enterprise of Rand, McNally & Co., the well-known railroad printers. The work forms a handsome and handy volume of 407 pages, so convenient and so easily handled that we fancy that for all business references it will be universally used instead of the heavy, bulky and inconvenient, though indispensable, general directory. We have not yet had an opportunity to ascertain its fulness and accuracy—of that we can tell better a year from this time; if it is as carefully prepared and edited as it is printed, it cannot fail to be satisfactory.

Chicago & Iowa.

Aid has been voted by all the towns on the line for a proposed branch of this road from Rochelle nearly due north to Rockford. A map of the road is published showing it to run due west from Aurora through Sugar Grove, Big Rock and Squaw Grove, to Clinton, thence northwest through Rochelle and Oregon to Forrester, thence west to the Mississippi at Savannah, running parallel with the Western Union from Lanark. From Savannah, a branch is shown extending up the east bank of the Mississippi to Duluth, and opposite Savannah a line extending westward across Iowa. Still, we suppose that the western end of the road is not yet finally located. The engineer is making final surveys between Aurora and Rochelle, and this part of the road must be completed by January next in order to secure the aid voted by Aurora. Tracklaying is to be commenced from Rochelle to Oregon within ten days. The road bed has been ready for a long time and the iron on hand for some time.

St. Paul & Sioux City.

Some time ago preliminary measures were taken to lease this road to the Lake Superior & Mississippi Railroad Company. It is now reported that the lease will not be made. The St. Paul & Sioux City Company intends to complete its road to St. James the present season.

Havana, Lincoln & Champaign.

The township of Clinton, DeWitt county, has voted \$25,000 in addition to the \$50,000 previously voted in aid of this proposed road. An injunction has been served upon the Supervisor to prevent the issue of the bonds.

Chicago Railroad News.

Chicago, Burlington & Quincy.

Last Monday coaches commenced running through to Omaha.

The train leaving the city at 5 o'clock p. m. now runs through across the Mississippi at Burlington to Ottumwa, Iowa, where the Burlington & Missouri River road crosses the Des Moines Valley Railroad. This train also connects with trains on the Burlington & Missouri River Railroad.

Lake Shore & Michigan Southern.

The new consolidated sinking fund seven per cent. bonds are offered to investors at 97½ by Robinson, Chase & Co., who describe and recommend them as follows:

"The Lake Shore & Michigan Southern Railway Company, for the purpose of providing for the payment of its several mortgage debts as they become due, has executed a mortgage to the Union Trust Company, of New York, as trustees, upon the whole of its railroad and branches, payable on the 1st day of July, in the year 1900.

"Coupon bonds of \$1,000 each will be issued, with interest at seven per cent. per annum, payable semi-annually, on the first day of January and July in each year, and registered bonds of \$1,000, \$5,000 and \$10,000 each, with interest at seven per centum per annum, payable quarterly, on the first day of January, April, July and October, in each year, principal and interest payable at the office of the Union Trust Company in New York.

"We call the attention of investors especially to this class of registered bonds, which, on account of the security afforded against loss by robbery, fire, or otherwise, and the payment of quarterly interest, offer an investment peculiarly desirable."

Chicago & Northwestern.

The National Camp Meeting which is to be held at the grounds near Des Plaines Station, begins next Wednesday and continues for ten days. The city camp meetings held annually on these grounds usually have been very largely attended, and as this is a national meeting and a State meeting unites with it, we may expect the road to have a large business in carrying passengers during the time of the meeting. Passengers from all points on the Chicago & Northwestern, the Rockford, Rock Island & St. Louis, and the Mineral Point roads will be carried to and from the camp grounds for one and a fifth fare. From Chicago to the camp and return the fare will be \$1. Baggage and tents will be carried free. No trains will run to the camp meeting on Sunday.

Transportation Contract.

We learn that Leopold & Austrian, the well known proprietors of the People's Line of steamers, have made a contract for the transportation of all men and supplies for the construction of the Northern Pacific Railroad from Chicago and Milwaukee to Duluth. In order to enable them to do this work the firm will purchase two additional propellers. They will commence delivering material and tools very soon.

Grand Trunk.

On the 16th instant, the sixth annual convention of the Illinois Press Association will assemble in this city, and on the 18th the members of the association will take the steamer Montgomery for Goderich, and travel thence by Grand Trunk Railway to Toronto, Montreal, Quebec and Boston. This will be a very beautiful excursion trip, and doubtless the attractions of the Grand Trunk route will be well advertised by those who enjoy it.

Railroad Men and Base Ball.

Base ball has latterly received much attention from all classes of business and professional men, and doubtless all of them have been able to add something, in their poor way, to a better understanding of the laudable art; however, this afternoon we anticipate some rather novel and startling developments out at Maywood, where the Chicago railroad officials will probably be well represented. The following notice, which has been received by most of the railroad officers in the city, will explain matters. It is headed "Grand Railroad Combination," "In union there is strength," and is inscribed with the exceedingly appropriate legend: "We are fearfully and wonderfully made":

"Dear Sir: At a meeting of railroad officials on Tuesday evening, August 2d, you were elected an active member of the Base Ball Club, which will meet the Club (also organized at same time) in a game for the championship of the world, on Saturday afternoon, August 6th, at Maywood, on the Chicago & Northwestern Railway. Trains will leave Wells street depot at 2 o'clock, sharp.

"You are hereby directed to be on hand, without fail. No excuse can be accepted. This will be the only occasion of the kind, and should you fail to appear you will probably regret it the balance of your days.

"By order of the combination.

"A. B. Leet and J. J. Young, Secretaries.

OFFICERS.

<i>Fearful Club.</i>	<i>Wonderful Club.</i>
W. W. Chandler, President.	Jno. C. Gault, President.
W. W. Street, Vice President.	E. S. Spencer, Vice Pres't.
L. D. Richardson, Treasurer.	A. J. Day, Treasurer.
A. B. Leet, Secretary.	J. J. Young, Secretary.

"The nine will be chosen on the grounds."

Springfield, Clinton & Gilman.

Two thousand men and 400 teams are at work on the line of this road, and it is intended to have it completed by the end of the year.

MECHANICS AND ENGINEERING.

Steam Traveling Crane.

The correspondent of *The Engineer* at the Royal Agricultural Show at Oxford describes as follows a useful piece of machinery:

"I saw nothing to-day which interested me so much as Messrs. Aveling & Porter's steam traveling crane, which is, as most of the readers of *The Engineer* are no doubt aware, a small traction engine steered from the foot plate, and fitted with a little jib crane in front. This particular engine has just come from Lille, and has already proved all but invaluable. How often does the engineer, when moving heavy weights, wish that he could get hold of some Titan who, without the aid of levers or screw-jacks, would take up the thing in his fingers and put it down where it was wanted. Well, here is the Titan. I was especially amused with its dealings with the corn mills. These are scattered all over the yard at various stands, but they have all to be brought to one place for testing. This work Messrs. Aveling's engine did, fetching and carrying tons just as a well trained spaniel will fetch and carry coats and sticks. At one moment it was to be seen running down the yard without a load; in less than five minutes it appeared returning with a mill complete, or a millstone hanging from the jib of the crane, just as one might carry an apple at arm's length. In one case the mill was in place, and the engine was sent for the top stone or runner. It returned with the wrong one, walked off with it, and brought two others, the last of which was the right one, in about half the time which would be absorbed by a laborer going and returning the same distance with his wheel-barrow. In a word, in this little crane we have the great hand and arm for lifting and shifting which we have all wanted so long. Intelligence is supplied by an uncommonly smart boy, who drives, steers, fires, takes orders, and looks serious all at once. Messrs. Aveling & Porter have several engines here, of which I shall have more to say at the proper time."

Road Locomotives.

Mr. J. K. Fisher, of New York, writes as follows to the *Iron Age*, commenting on an article in *The Engineer*, concerning steam on common roads:

"In the article from *The Engineer*, in your journal of July 21, it is said that 'the only reason that greater speed is obtainable on rails than without them, is that the rail has a hard, smooth, unyielding surface, and that the common road has a soft, rough and yielding surface. If we turned off the flanges of a locomotive, and ran it on an iron road, made with a smooth, level surface, we could evidently get the same speed as we get on rails.' This comparison agrees with the opinion held by the early railway men, that the resistance to rolling is constant at all speeds; and its appearance in a journal of high authority, indicates that there is still an imperfect understanding of the difference between the resistance of coned and flanged wheels on rails, and cylindrical wheels on planes. The dynamometer shows that the resistance on rails increases with the speed at such a rate that one-third lb. per ton per mile per hour is allowed, in addition to the resistance of 6 lbs. per ton at the slowest motion. On planes no such increased resistance has been shown; and the reasoning which led to the conclusion that the resistance to rolling was constant at all speeds on rails, is good in favor of the conclusion that it is constant at all speeds on planes. The reasons why it did not hold good on rails are now well known to be that the flanges rub against the rails, and the cones cause the wheels to run on unequal diameters, and to slip—being fixed on their axles; and these effects increase as the irregular motions caused by speed increase. An inspection of old wheels will show that much power must have been expended in wearing their flanges and cones."

"Mr. P. W. Barlow, Jr., an English railway superintendent, who has lately made a tunnel under the Thames, estimated the resistance of an omnibus propelled by men at 4 lbs per ton, in his tunnel. I do not believe it would be so little on rails, and in a narrow tunnel; but on an iron floor, in open air, I believe his estimate not too small; or, 4 lbs. per ton at all speeds, would be the resistance of rolling and axle friction for light vehicles. There is a resistance of the air, which increases as the square of the speed; but which may be lessened by rounding the ends and smoothing the sides of carriages. There is also a great resistance caused on rails by side winds, which press the leeward wheels against the rails; from this resistance cylindrical wheels would be free."

"Mienel, in 1839, recommended iron plates, about a foot wide, to be laid on the turnpikes, for steam carriages. On suburban roads iron floors would be better and cheaper than any flooring now used. And on such floors, at the speed likely to be adopted, the total resistance per ton would be less than half what it is on rails; and the dead weight would be about a third; or the

power would be a sixth of what it is on rails, the same loads being carried."

The Rigi Railway.

The following description of this mountain line is given by a correspondent of *The Engineer*:

"I have not seen in your paper any account of the Rigi Railroad, and, as it is being made on an unusual plan, I thought a few particulars might interest some of your readers. On Tuesday last, after having spent the night at the Rigi Kulm Hotel, I took the steamboat Weggis to Fetzna, and about ten minutes walk brought me to the station-yard. The station is not yet built, only a wooden shed for the engine and a turntable being completed. Immediately after leaving the station-yard the ascent is commenced, and in about 100 or 150 yards the incline of 1 in 4 begins, and will, I believe, terminate only at the summit. The rails, which are very light, are laid down to what appears the ordinary gauge; in the middle is a wrought iron rack rail of about 4 inch or 5 inch pitch; the rails are laid on transverse sleepers, and outside the rails, longitudinal beams are bolted to the sleepers. The locomotive, 'Stadt Luzern' by name, has (when on the incline of 1 in 4) a vertical boiler, the cylinders are 11½ inches diameter and 16 inch stroke; they are outside, and are parallel to the rails. The valve motion is of the straight link kind, the eccentrics being outside the crank pin. As is very often seen on the continent, the machine is supported on four wheels; their diameter is, I should think, about 2 feet 4 inches; they are loose on their axles, the rack wheels are keyed on in the middle, and one axle is driven by the engine by spur gearing, the engine making three revolutions to one of the rack-wheel: the axle which is not worked by the engine has two friction wheels keyed on it for the brakes to press on, and the brake on the only truck I saw was of the same sort."

"Soon after I got to Fetzna a truck holding some three tons of gravel was ready to be taken up the incline; it was pushed, not drawn, by the engine at the rate of some four or five miles an hour. I ought to say that on it were some twenty or twenty-four tourists, which would increase the load by a ton or ton and a-half. There were no springs to the engine, for I suppose they are quite unnecessary at such a slow speed. In running down the hill the engine was kept in forward gear, and the regulator very slightly opened."

"The truck was not coupled to the engine, so that should the brakes or steam by any accident fail to stop the train, or should the engine get off the line (which I think is quite impossible), the truck could be stopped by its own brake."

"I could not help thinking that on such a very steep incline a rope railroad would have been best, while the rack rail might have been used to prevent any skidding when the brakes were applied. The engine came from some firm at Olten, whose name I forget; the workmanship appeared to be very good."

Cylinders in Narrow Gauge Locomotives.

The arrangement of locomotive cylinders on gauges so narrow that it is necessary to do away with all tendencies to oscillation is thus described: "The steam cylinders are placed one above the other in a center-line between the driving-wheels, the piston-rod from one being connected by the connecting-rod to the crank of the front-driving axle, and that from the other to the crank of the hind axle. The cranks are placed at right angles. By applying the power to both cranks in a central line between the rails, the tendency of the engine to oscillate is removed; whereas in the ordinary mode of applying the power first on one side and then on the other, the strain is constantly in opposing directions, and the flanges of the driving-wheels are moved more or less towards the rails, thereby producing oscillation."

Street Railroads vs. Street Locomotives.

In the House of Lords a short time ago Lord Redesdale is reported to have said in relation to applications for laws permitting the construction of street railroads called, in England "tramways":

"The information at present possessed upon the subject of tramways did not warrant the conclusion that they would be an unquestionable success; indeed, the report which had been made to the War Department upon the subject of road traction engines showed that conveyances of that kind would very soon come into general use. The report to which he referred stated that an omnibus was now being constructed with india-rubber wheels, to carry 65 passengers, and could be easily adapted, both in size and power, to carry a whole company of infantry, and run over the road at from six to ten miles an hour, at a cost of wear and tear of 3d. per ton per mile. This would be a great competitor with the tramways, and the promoters of such schemes should bear in mind what a formidable rival was likely to come into competition with them."

Railroad Manufactures.

At the Harrisburg Car Works nine cars are finished daily.

With one or two exceptions, the Vulcan Works, at Chattanooga, are the largest in the South. They run ten puddling furnaces, two train of rolls, a steam hammer and machine shop, blacksmith shop, &c., employing 150 men, and turning out large quantities of bar iron, car axles, and forgings generally. They are making quantities of fish bars for the railroads near Chattanooga. The capacity of the mill is about 20 tons per day. Maj. S. B. Lowe is the builder and manager of the works.

The Roane Iron Company of Chattanooga has purchased the Southwestern Company's rolling mill and is now re-rolling old rails. It is adding a large puddle mill which will contain ten puddling furnaces. It will erect another stack at Rockwood in order to secure a supply of iron for the rolling mill, and proposes to erect a blast furnace in Chattanooga.

A site has been selected and a company organized to construct a car wheel foundry and box car factory in Chattanooga. Its erection will be commenced some time this summer. Capital stock \$30,000.

The car shops at West Albany, New York, are said to be turning out twenty new freight cars every week.

The Southern Car Works and Manufacturing Company is in active operation in New Orleans. It proposes soon to increase its force to 500 men.

The Mason Manufacturing Company, of Springfield, Mass., has lately completed nine first-class passenger cars for the South Side Railroad of Long Island, and is building 300 box cars for the Rutland & Burlington Railroad.

The Baldwin Locomotive Works employ seven hundred hands, whose aggregate wages amount to \$150,000 per month. The sales of the firm reach somewhere in the neighborhood of \$5,000,000 annually.

Tints to Express Building Materials.

The tints employed among engineers and architects for maps and plans are as follows:

MATERIALS.	COLOR.
Brickwork to be executed (in plans and sections)...	Crimson lake.
Brickwork in elevations...	Crimson lake mixed with burnt sienna or Venetian red.
The lighter woods, such as fir.....	Raw sienna.
Oak or teak.....	Vandyke brown.
Granite.....	Pale Indian ink.
Stone generally.....	Yellow ochre or pale sepia.
Concrete works.....	Sepia, with darker markings.
Wrought iron.....	Indigo.
Cast iron.....	Payne's grey or neutral tint.
Steel.....	Pale indigo tinged with lake.
Brass.....	Gamboge or Roman ochre.
Lead.....	Pale Indian ink tinged with indigo.
Clay or earth.....	Burnt umber.
Slate.....	Indigo and lake.

Sliding on Steel Rails.

A point of some interest has arisen in connection with the use of steel rails on the Great Central Belgian Railway. It is found that steel rails which have been laid resist wear and tear extremely well, but that they acquire such a polish that the action of brakes and the adhesion of engines upon them are seriously interfered with. Experiments upon the subject are being made with a view to the collection of further facts.—*The Engineer*.

Fracture of Car Axles.

Prof. W. J. Macquorn Rankine, of Glasgow, writes as follows on the above subject in *The Engineer*:

"The public attention has been called for a time to the fracture of railway axles; and in some of the writings that have appeared on the subject I see that there is an attempt to revive the hypothesis of a gradual change in the molecular structure of the iron from fibrous to crystalline. That hypothesis I believe to be not only unconfirmed, but contradicted by experience."

"It is now about thirty years since my late father—Lieutenant David Rankine—began to form a collection of railway axle journals, which, after having run safely for periods ranging from two to four years, had suddenly broken under their ordinary loads; and to make, with my assistance, experiments on the means of preventing such fractures. I made a set of full-sized drawings showing the exact appearance of the fractured surfaces, and sent the journals and the drawings, and a description of the observations and experiments, to the Institution of Civil Engineers. An abstract of the paper was published in the 'Minutes of the Proceedings' of that body for the 7th of May, 1843, page 105; and the drawings, by permission of their council, were lithographed and published in the 'Transactions' of the Institution of Engineers in Scotland for 1842-3. For details, then, I may

refer to those publications. The general results were as follows:

"(1.) In every instance of spontaneous fracture the iron had retained its fibrous structure to the very instant of breaking, the only crystals observed having been very few and very minute.

"(2.) In every instance the fracture had commenced by the formation of an invisible crack or flaw at the angle where the journal joined the body of the axle. That flaw gradually kept inwards, until the area of sound metal left became so small as to snap suddenly under the ordinary load.

"(3.) The following were the values of the tensile stress on the iron, calculated by the ordinary formula as for a steady load; and it is probable that through shocks and vibrations those values may have been occasionally increased to double. In the sound journal, before the commencement of the flaw, 9,000 lb. on the square inch; in the reduced area of sound iron, at the instance of fracture, from 33,000 lb. to 55,000 lb. on the square inch.

"(4.) The formation of the flaw evidently originated in the want of continuity of form and of surface fibres at the 'nick' or angle of the shoulder, which, by checking the elastic play of the fibres, caused them to give way to shocks which they would have borne safely had continuity been preserved.

"(5.) The remedy proposed was to reduce the diameter of the journal as far as practicable by forging with the hammers, instead of by turning down, in order to preserve continuity of surface fibres; and to make the shoulder with a curve, instead of an angle, in order to preserve continuity of form. This method was tried in practice, and proved perfectly successful. The journals made according to it took from five to eight times as many blows with a hammer to break them off as those turned down in the common way to a square shoulder; and they were never known to break under the traffic.

"The mere formation of a curved shoulder by cutting, so as to avoid an angle, without forging down, so as to preserve continuity of surface fibres, is not sufficient to prevent spontaneous breaking. This was proved, amongst other examples, by the fracture of an axle described to the Institution of Civil Engineers by Mr. Glynn (see 'Minutes of Proceedings' 23d April, 1844, page 202.)

"The same subject is discussed with very great ability, and the same conclusion arrived at, in a paper by Mr. F. J. Bramwell, which was read to the British Association at Exeter, and published in their reports for 1869, page 423."

Boiler Explosions.

Mr. Macnaught, chairman of the Boiler Insurance and Steam Power Company (Limited), Manchester, in his evidence before the Select Committee of the House of Commons, said he was of opinion that if there were a general and proper system of inspection of boilers there would only be about one-fourth of the explosions which now occur. He suggested the appointment by the Government of agents to attend inquests on boiler accidents, to sift the evidence, and to prosecute in the event of a verdict of manslaughter being returned.

Hot Boxes.

A correspondent of the *Iron Age* writes from Philadelphia:

"Can not some live Yankee supply a cure for 'hot boxes' on railway trains? With the constant improvements in railway machinery, this would seem to be a simple invention, and yet it hasn't arrived. The question was suggested by a detention to your correspondent the past week, by which your readers lost their no doubt valued (if not valuable) correspondence. The Pacific Express, the lightning train from Chicago, made its usual excellent time as far as Harrisburg, and should make no stop from that city to Philadelphia, a run of 105 miles. In half an hour the train was stopped with two journals smoking in a forward car. Buckets of water and greasy waste cured this, and the run, after the loss of fifteen minutes, was continued below Lancaster. Shortly again the train halts, and this time a lively tongue of flame is issuing from a journal on a rear car. Three successive stops were made on account of this trouble before reaching Philadelphia, and the loss of time in the aggregate very considerable. Now, we respectfully submit that as somewhat greater problems in machinery have been solved, that the remedy for this nuisance lies within the possibility of human genius. To the man who does it we promise a customer certain in one of the leading railways, if we can judge any thing from the remarks of a prominent railway official on that 'hot box' train."

Storage of Paints and Oils in Shops.

A correspondent writes: "Our railroad companies, and indeed all manufacturers using paints and oils, should make it a point of the utmost consequence to see that these combustible and dangerous materials are at once removed from their workshop buildings and put in a shop exclusively devoted to them. Then if a fire

breaks out among them, only a trifling loss can ever result from it, and fewer accounts of the destruction of costly car shops or other buildings by fires starting in paint shops would be published.

"One of our wire-rope manufacturers, after a fire had occurred in his main building from paints kept there, moved them all into a brick cell just outside the door which was covered with brick arches turned between old iron rails, which served as roof beams."

The American Bridge Company.

This is the name of the bridge building firm which has recently been formed by the consolidation of two of the largest bridge building firms of the country, viz.: L. B. Boomer and Boyington & Rust, whose work is widely and favorably known throughout the Northwest. The firm as now organized has an establishment unsurpassed in extent and facilities for the construction of both wood and iron, highway and railroad bridges, and also turn tables, roofs, heavy castings, and general bridge iron work. It uses for substructures, masonry, pneumatic piles and screw piles, and for superstructures Post's patent diagonal iron truss, Post's patent diagonal combination truss, Howe's truss, plate and trussed girders, etc. Among its contracts now in hand are the great bridges over the Missouri, at Omaha and Leavenworth, and many others less extensive.

The office of the company is at Rooms 1, 2 and 3, Andrew's building, No. 157 LaSalle street, and its works at the corner of Egan and Stewart avenues, where the Pittsburgh, Fort Wayne & Chicago Railway crosses the city limits. The officers of the new company are L. B. Boomer, President; H. A. Rust, Vice President; L. C. Boyington, General Agent; M. Lassig, General Superintendent; and W. E. Gilman, Secretary. In its employ are several of the most accomplished bridge engineers of the country.

A Locomotive's Work.

Jacob Ungeter, an engineer of the Louisville, Cincinnati & Lexington "Short Line" Railroad, reports that engine No. 24 on this road from the 1st of July 1869, to the 30th of June, 1870, a Rogers engine, 16x24 inch cylinder, 5 foot 6 inch wheel, ran during the year 44,800 miles; her lowest mileage in a month was in February when she ran 3,300 miles; her highest mileage for one month was in July, 1869, when she ran 4,380 miles. She has not lost a trip during the whole year. The average mileage per month is 3,733 1/3 miles.

A New Locomotive.

Charles Wilson, of the Brotherhood of Locomotive Engineers, writes as follows of a locomotive recently built by Wilson Eddy, Master Mechanic of the Boston & Albany Railroad:

"Mr. Eddy has recently turned out a new engine from his shop that possesses some new peculiarities. The truck and tender wheels have steel tires, welded to a cast iron spider by a new process invented by Mr. Nathan Washburn, of Worcester, Mass. If Mr. Washburn succeeds in making his new wheels hard enough to stand the wear on the flanges he will have the best wheel that has ever been made. The wheels are all turned up in a lathe, and it makes a much more perfect job than the old way."

Need Railroad Traveling Be Dirty.

"It is pleasant to read of a railroad in this country thoroughly built. The accounts given of the new Connecticut Air Line road give the impression that its managers are using in its construction all the most modern improvements—double track, steel rails, fish joints, wrought iron bridges, &c. It is also asserted that the speed of trains is to be sixty miles per hour.

We hope all these promises may be kept; but wish just now to speak of a remark attributed to the President of the road:

"To get a car which is lighter and stronger, and which shall weigh three tons less, and a car which shall be absolutely impervious to dust, will be my greatest aim when this road is finished, so that we can send a man from Boston to New York without his being compelled to wash his face on his arrival."

It becomes us therefore to try to perfect railroad traveling; and certainly no greater improvement could be made in this than the contrivance of a car which should exclude dust while it admitted an abundant supply of pure air. Important improvements have been made in this country in the construction of cars; but perfection is not yet reached. Some of the new Pacific Railroad cars are said to be marvels of luxury; but it is deplorable that in the arrangement of cars and hotels luxury so often precedes comfort—which is, after all, the greatest luxury. Gilding, carving, plate glass, costly woods, and cushioned seats make a fine show; but they do not keep out the dust; they do not make the air pure and wholesome; they do not make traveling comfortable. That we have yet to attain."

So says the New York Post. The national tastes, however, are against the success of the effort. We Americans love show above all things. What Emerson in his *Society and Solitude*, says of our household life, is equally true of our shop life, our religious life, and our railroad life. It is of less consequence to us that things are good, sound, safe, and durable, than that they are gay,

glittering, stunning, or stimulating to the vulgar imagination. Emerson says:

"It is a sufficient accusation of our ways of living, and certainly ought to open our ear to every good-minded reformer, that our idea of domestic well-being now needs wealth to execute it. Give me wealth, says the wife, and your house shall not annoy your taste nor waste your time."

But what has wealth to do it? Simply that all our ideas are material, and therefore expensive. We are not satisfied with simple goodness. The preacher, the actor, must be "a star." The family room must be bedizened into a "Salon." The good old English coffee-house, that acme of quiet comfort and hearty cheer, is transmogrified into a Taylor's Restaurant, without a vestige of comfort left to redeem its flash vulgarity. The comfortable old leather-seated car is superfluous and overdone into the stuffy, plush-velveted, belooking-glassed, and begilt "palace" car. Wealth is squandered recklessly, ignorantly, and most vulgarly, on all sides, to procure not what the vitiated tastes of our people have got to abominate, namely, cheap comfort, but what they insist upon having at all hazards and regardless of expense, namely, show—show that shows wealth, for wealth's sake. We trust in a good time coming; in a reaction of public taste, when the railroad traveling world, and every other department of public and private life, will sleep off this nightmare, and awake some fine morning, bathe itself, put on honest homespun and behave like a reasonable being. Then the Post's inquiry, "need railroad traveling be dirty," will stand a chance of being properly answered.—*Railroad and Mining Register.*

Fast Trains.

Almost every periodical, in its turn, has commented upon the present fast schedule of time between New York and Chicago and New York and Cincinnati; and some, prophetic of ill, have predicted that dreadful accidents would result from a twenty-seven hour run between New York and the Northwestern metropolis. Hitherto these fast trains, by either route, have been extensively patronized, and are reported by the managers to be the best-paying trains on the road. They have been regularly run on time, and have enjoyed an immunity from accident almost unparalleled. There is no doubt that these fast trains resulted from the spirit of competition existing between the rival trunk lines; but the progressive spirit of our age, and demands of the traveling public, would, sooner or later, have forced upon railroad managers a faster schedule of time between prominent cities than that used in the winter of 1869 and the spring of 1870; and the road-bed, rolling stock and machinery of the trunk lines have been improved so materially during the past two years, that they can, with ease and safety, attain a speed unsurpassed by European railroads. At present, the running time west from New York to Chicago is, at most, the same by all competing routes. Passengers by the Pennsylvania and Fort Wayne route, leaving New York at 9:30 a. m., arrive at Chicago at 8 p. m. the following day; while those patronizing the North, or Lake Shore route, leave New York at 10:30 a. m., arriving at Chicago at 4:00 p. m.; but the short line carries off the palm in the eastward-bound schedule, and seldom, if ever, fails to keep up to its advertised time of twenty-seven hours between Chicago and New York. It has been anticipated that the shore lines, in connection with the New York Central, would make a corresponding advance in speed; and that, by leaving Chicago two hours later than on their present schedule, and arriving in New York the same hour as now, they would virtually make the same running time; but, at the present writing, no change has been made, and, perhaps, will not be until the arrangements introduced on the Hudson River Railroad, for taking water without stopping, are fully perfected. Apropos of the fast trains, we may remark that the running time between stations is little, if any, faster than that of the ordinary express or mail trains; but, by making few stops and preserving a uniform rate of speed, they economize considerably in time, and insure greater satisfaction to the traveling public. A careful scrutiny of the various time-tables, east and west, made this summer, shows that the running of passenger trains is reduced much more than heretofore to a science; and while each railroad competing for through business has introduced a much faster schedule than heretofore, still in no instance has such increased speed been made to the disparagement of local business, or to all appearances, with an increase of operating expenses.—*Official Railway Guide.*

Northwestern of Virginia.

There were rumors in Baltimore last Wednesday of the over-issue of the stock of the Northwestern Railroad Company, commonly known as the Parkersburg branch of the Baltimore & Ohio Railroad, which is leased and worked by the latter company. The over-issue is stated in the Baltimore papers to amount to \$300,000, made by the Secretary of the company, John L. Crawford, who has resigned. The amount at which the over-issue is fixed is supposition merely, as no statement has been made by Crawford, and the Directors have not concluded the examination. The over-issue is all hypothesized in Baltimore at about \$15 on the share, the par value of which is about \$50. Crawford, Secretary of the company, was the confidential clerk of the banking house of Alexander, Brown & Sons for many years. Ex-Senator Van Winkle, President of the company, it is stated, entrusted to the Secretary blank certificates of stock bearing his signature.

Springfield & St. Louis.

The subscription to this proposed road, which seems intimately connected with the Springfield & Clinton project, now amount to \$145,000.

—The Board of Commissioners of the St. Louis, Lawrence & Denver Railroad Company met at Pleasant Hill on the 21st of July, and instructed the Pacific Railroad to consolidate the Pleasant Hill & Lawrence Branch of the Pacific Railroad with the St. Louis, Lawrence & Denver Railroad. The terms of consolidation proposed are approved by the St. Louis, Lawrence & Denver Railroad Company, and there is but little doubt will prove satisfactory to the Pacific Railroad. In this event the consolidation will be made in a few days, and the Lawrence Company will at once resume work, and finish the road.

—On the 14th and 15th of July, a convention was held at Pleasant Hill, which resulted in the organization of a company for building the "Pleasant Hill Branch of the Lexington, Chillicothe & Gulf Railroad." This road will be 36 miles in length, and \$1,000 per mile was duly subscribed. The officers elected are Theo. Stanley, President; I. T. Crisp, Vice President; Jno. F. Lawder, Secretary; Chas. P. Duntaugh, Treasurer; J. L. Morrison, Attorney; R. G. Leaming, Land Commissioner.

WANTS.

Small Advertisements will be inserted under this head at ten cents per line for the first insertion, and five cents per line for each subsequent insertion.

WANTED—By a practical machinist, who has had considerable experience, and who has profited by it, a situation as engineer of a stationary engine, or employment in locomotive shops. He may be heard from by addressing "ENGINEER," at this office.

WANTED—By a first class Varnish house in New York, a Railroad man, to travel and sell their goods to Railroad Companies. To a first-rate man a good opportunity is offered. Address with full particulars, P. O. Box 3373 New York City.

To Railroad Managers.

A Telegrapher of fifteen years' experience, now occupying a position as manager of an important telegraph office in the East, desires a position as superintendent or general manager of a railroad telegraph line in the West. Satisfactory references will be given as to qualifications and business ability. Applications may be made to the Editor of THE TELEGRAPH, New York.

Canadian Air Line Railway Co.

The Directors of the Canadian Air Line Railway invite tenders for the construction of their line. Plans and specifications for the section from Glencoe to Aylmer will be on exhibition at the office of the Chief Engineer, G. L. Reid, Esq., Hamilton, from the 2nd of August next.

All offers must be in the hands of the undersigned before the 2d day of September next marked.

"Tender for construction of Canadian Air Line Railway."

JOSEPH PRICE,
SECRETARY.

HAMILTON, Ont.,
July 25th, 1870.

THE AMERICAN BUILDER, AND JOURNAL OF ART.

CHICAGO.

A PAPER FOR EVERYBODY.

Every Architect, Builder and Mechanic Should have it.

Its pages contain the best and most original designs, fully illustrated; and adapted for general use.

The original articles that appear in each number of THE BUILDER, together with its Original and Beautiful Designs for

Cottages and Residences, make it worth many times its subscription price.

TERMS:—\$3.00 per Year.

Address CHAS. D. LAKEY,
115 Madison St., Chicago.

HARRISBURG Foundry and Machine Works!

(Branch of Harrisburg Car Mfg Co.)

Harrisburg, - - Pennsylvania.

MANUFACTURERS OF

MACHINISTS' TOOLS!

—SUCH AS—

LATHES, PLANERS,
Shaping and Slotting Machines,
Bolt Cutting & Nut Tapping Machines, &c.

W. T. HILDRUP, Treasurer.

Baldwin Locomotive Works.

M. BAIRD & CO., Philadelphia.

MANUFACTURERS OF

Locomotive Engines,

ESPECIALLY ADAPTED TO EVERY VARIETY OF RAILROAD SERVICE,

—AND TO—

The Economical Use of Wood, Coke, Bituminous and Anthracite Coal as Fuel.

ALL WORK ACCURATELY FITTED TO GAUGES, AND THOROUGHLY INTERCHANGEABLE.

Plan, Materials, Workmanship, Finish and Efficiency, Fully Guaranteed.

M. BAIRD.
GEO. BURNHAM.

CHAS. T. PARRY.
EDW'D H. WILLIAMS.

WM. P. HENSZEY.
EDW'D LONGSTRETH.

MARSH & GOODRIDGE.
256 STH WATER ST CHICAGO.

Dealers in

R. R. Cross-Ties, Telegraph Poles,

FENCE POSTS, BRIDGE TIMBER,

Piles, Hard-wood Plank, &c., &c.,

To which the Attention of Railroad Contractors and Purchasing Agents is respectfully called.

REFER TO:—Jas. M. Walker, Chicago, Pres't L. L. & G. R. R.; Jas. E. & Wm. Young, Chicago, Railroad Builders; H. J. Higgins, Purchasing Agent C. B. & Q. R. R.; and Railroad Officers and Purchasing Agents generally.

MARSH & GOODRIDGE,
256 South Water St., Chicago.

ANDREW CARNEGIE,
PRESIDENT.
ANDREW KLOMAN, GEN. SUP'T.

THOS. M. CARNEGIE,
VICE-PRESIDENT.

THE UNION IRON MILLS,

OF PITTSBURGH, Pa.

Sole Manufacturers, under our own Patents, of

IMPROVED "I" BEAMS,

CHANNEL BARS,

Best Quality of

LOCOMOTIVE & CAR AXLES,

("KLOMAN" Brand.)

"Linville & Piper's Patent"

Round and Octagonal HOLLOW

WROUGHT IRON POSTS,

—AND—

"Upset" BRIDGE LINKS

GENERAL WESTERN OFFICE:

No 13 Fullerton Block, Dearborn-St.,

CHICAGO, ILLINOIS.

THE UNION IRON MILLS manufacture all sizes of Pipe Iron, Merchant Bar, Forgings, Hammered and Rolled Locomotive and Car Axles, from the very best iron. Splice Bars (or Fish Plates), to suit all Patterns of Rails. Bridge Iron and Bolts "I" Beams, Girder Iron, Channel Iron, &c.

WALTER KATTE, Western Agent.

MANUAL

OF THE

Railroads of the United States

FOR 1870-71.

Showing their Mileage, Stocks, Bonds, Cost, Traffic, Earnings, Expenses, and Organizations;

WITH A

SKETCH OF THEIR RISE, PROGRESS, INFLUENCE, &c.

With an APPENDIX,

Containing a Full Analysis of the Debts of the United States, and of the Several States.

BY HENRY V. POOR.

Price \$5. Delivered at any address.

Published by H. V. & H. W. POOR,

87 Broadway, New York. L. S. TILLOTSON & CO., N. Y. G. H. ELLIS, CHICAGO.

RUFUS BLANCHARD,

146 Lake St., Chicago,

Has Issued a NEW STYLE of

MAPS!

IN FLEXIBLE CASES,

Which are both cheap and convenient. The following States are now ready: Illinois, Iowa, Missouri, Kansas, Nebraska, Minnesota, Wisconsin, Indiana, Michigan and Ohio. Mailable on receipt of 25 cents. They show the counties, towns and railroads and are fine specimens of workmanship.

WM. U. THWING, PATTERN

—AND—

Model Maker!

Calhoun Place, Rear of No. 120 Dearborn Street, Chicago, Third Floor.

Employing none but the best workmen, and having superior facilities, I am prepared to do the best work (using the best materials) at low figures, and guarantee satisfaction. Patent Office Models a specialty.

PATENT GRAVITATING

Railroad Frog

FOR SALE:

The entire Right of HICKMAN'S PATENT GRAVITATING RAILROAD FROG for the United States. A model may be seen and circulars obtained at

Room 3, Farwell Hall.

Here is a chance for some man, as the patent must be sold immediately.

BLISS, TILLOTSON & CO.,

Manufacturers and Dealers in

TELEGRAPH MACHINERY,

—AND—

SUPPLIES

Of Every Description.

247 South Water Street,
CHICAGO, ILL.

THE AMERICAN BRIDGE CO.

Manufacturers and Builders of

Bridges, Roofs,
Turning Tables,

—AND—

PIVOT BRIDGES.

Wrought Iron Columns,
Heavy Castings,

—AND—

General Iron and Foundry Work.

For Railway and Road Bridges, this Company employ the following well-established systems, viz:

For Bridge Superstructures.—Post's Patent Diagonal Iron Truss; Plate and Trussed Girders; Post's Patent Diagonal Combination Truss; Howe's Truss, and any other desired systems.

For Bridge Substructures.—Pneumatic, Screw Piles, and Masonry.

Descriptive Lithographs furnished upon application. Plans, Specifications and Estimates, together with Proposals, will be made and submitted, when desired.

WORKS: Cor. Egan and Stewart Avenues. OFFICE: Rooms, 1, 2 & 3 Andrews' Bldg, 157 LaSalle St. Address THE AMERICAN BRIDGE CO., No. 157 LaSalle St., Chicago.

L. B. BOOMER, Pres. W. E. GILMAN, Sec'y. H. A. RUST, Vice Pres. M. LASSIG, Gen. Supt. L. C. BOYINGTON, Gen. Agent.

CHICAGO, July 30, 1870.

REFERRING TO THE ABOVE CARD of "The American Bridge Company," it is hereby announced that the undersigned, hitherto engaged in the business of Bridge Building, &c., under the respective firm names of L. B. Boomer and Boyington & Rust, have this day sold and transferred to the said Company all the property, consisting of real estate, buildings, machinery, tools, cars, vessels, fixtures, &c., heretofore employed by them in the prosecution of their said business, as also their incomplete contracts, which contracts will be executed by said American Bridge Company.

The existence of the said firm of L. B. Boomer and Boyington & Rust is hereby terminated.

With the enlarged resources and facilities afforded by this consolidation of interests, we bespeak for the American Bridge Company the continuance of the patronage of our patrons and friends, and we promise that the reputation as to character of work and promptness in execution earned by ourselves, shall by the American Bridge Company be maintained and added to.

L. B. BOOMER, L. C. BOYINGTON, Late firm of H. A. RUST, Boyington & Rust.

CHICAGO, July 30, 1870.

The Mercantile Agency.

R. G. DUN & CO.'S

Reference Book!

For the Semi-Annual Term, commencing July 1st.

It contains the names and business of individual traders and firms throughout the States and Territories, Canada and Nova Scotia, with their

CAPITAL, CREDIT AND STANDING

In the communities where they reside, revised by their own Exclusive Agents and Correspondents, upon fresh detailed reports.

Several Thousand New Names

Have been added since the last volume, and a vast number of changes made in old quotations.

Names no longer in Business have been Dropped.

THE REFERENCE BOOK may be seen at the office in New York and the other cities, and with

Claims for Collection

Promptly attended to throughout the United States and the British Provinces.

The aim of the Publishers has been to produce a Standard Reference Book upon which dispensers of credit may rely with confidence in its freedom from inflation or exaggerations. The tendency has been to moderate rather than over-estimate. They have endeavored to guard against improper influence in all directions. A COMPLETE

List of National Banks,

With their Capital and Officers appointed.

This Agency was established in 1841. Long experience, enlarged facilities, and the faithful performance of its work, combine to make it

THE STANDARD AGENCY.

R. G. DUN & CO.

OFFICE:

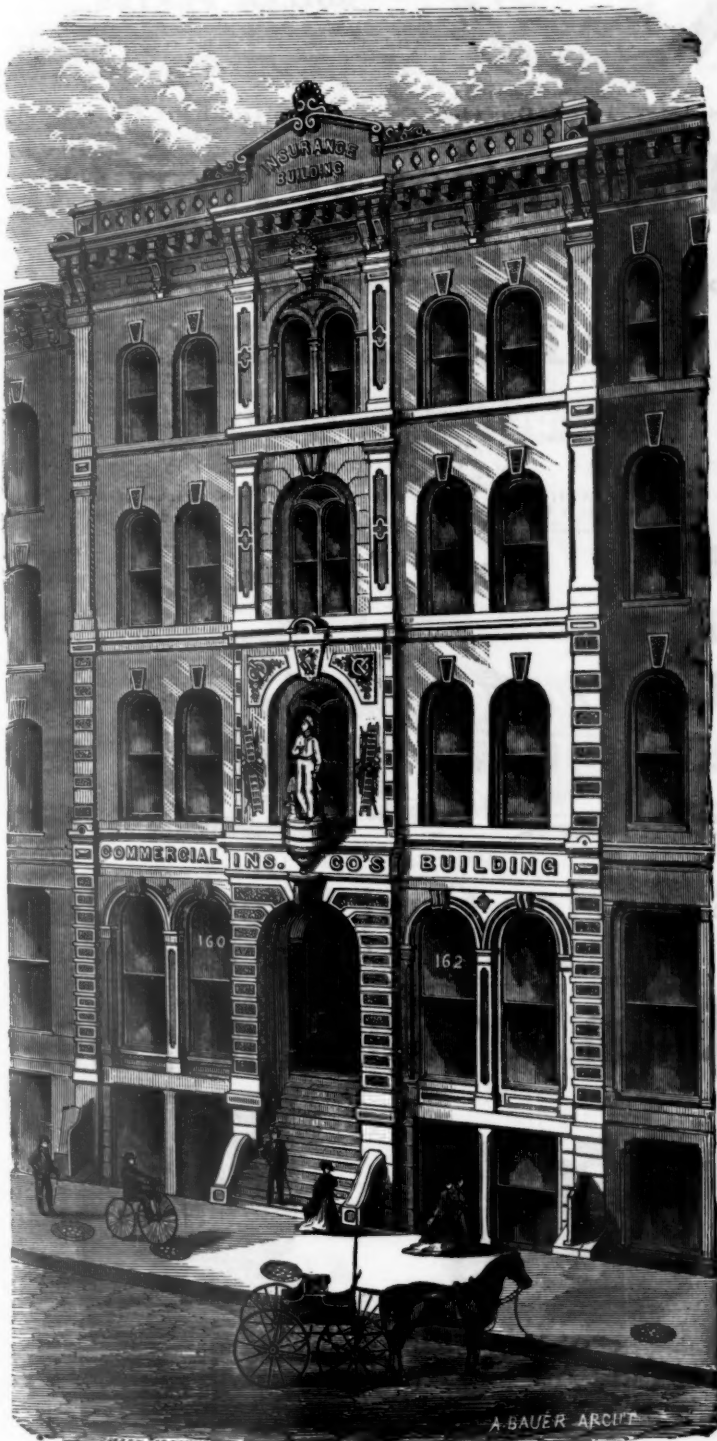
101 & 103 Wabash Ave.,

CHICAGO, — — ILLINOIS,

ALEX. ARMSTRONG, Manager.

Manager of the Pittsburgh Branch from 1864 to 1866.

THE Commercial Insurance Co., OF CHICAGO.



Organized May 1st, 1865.

Assets, May 1, 1870,	\$403,282.91
Unincumbered Real Estate,	170,549.88
Receipts since Organization,	583,964.31
Losses Paid,	219,041.52

DIRECTORS.

J. F. ARMOUR,	JOHN E. CHAPMAN,	JOHN C. DORE,
WM. F. KAY,	E. F. LAWRENCE,	L. B. SIDWAY,
T. H. SEYMOUR,	H. SPRUANCE,	H. SPRAGUE.

OFFICERS.

JOHN C. DORE, President.	WM. F. KAY, Vice-President.
JOHN E. CHAPMAN, Treasurer.	J. FARMER, Secretary.

OFFICE IN COMPANY'S BUILDING, 162 WASHINGTON ST.
CHICAGO, ILLINOIS.

UNION TRUST CO., OF NEW YORK.

No. 73 Broadway, cor. Rector St.
Capital, - - 1,000,000.

[All paid in and securely invested.]
INTEREST ALLOWED ON DEPOSITS, which may be drawn at any time.

This Company is by law and by the order of the Supreme Court made a legal depository of money. It will act as Receiver in cases of litigation, take charge of, and guarantee the safe keeping of all kinds of Securities, and collect coupons and interest thereon.

It is authorized by law to accept and execute all trusts of every description, in reference to both real and personal property committed to them by any person or corporation, or transferred to them by order of any of the Courts of Record, or by any Surrogate.

It is especially authorized to act as Register and Transfer agent and as Trustee for the purpose of issuing, registering or countersigning the certificates of stock, bonds or other evidences of debt of any corporation, association, municipality, State or public authority, and will pay coupons and dividends on such terms as may be agreed upon.

In giving special prominence to this department of its business, attention is particularly called to the paramount advantages of employing this COMPANY in the capacity of AGENT, TRUSTEE, RECEIVER OR TREASURER, in preference to the appointment of individuals. A guarantee capital of ONE MILLION DOLLARS specially invested by requirement of its charter, and a perpetual succession; a central and permanent place of business, where business can be transacted daily, without disappointment or delay; its operations directed and controlled by a responsible Board of Trustees; and its entire management also under the supervision of the Supreme Court and the Comptroller of the State.

Permanency, Constant and Responsible Supervision, Guaranteed Security and Business Convenience and Facilities, may therefore be strongly urged in its FAVOR on the one hand, against the Uncertainty of Life, the Fluctuations of Business, Individual Responsibility and General Inconvenience on the other.

ISAAC H. FROTHINGHAM, President.
AUGUSTUS SCHELL, Vice-President.
HENRY K. BOGERT, Vice-President.

TRUSTEES.

A. A. LOW,	JOHN V. L. PRUYN,
HORACE F. CLARK,	BENJ. H. HUTTON,
DAVID HOADLEY,	JAS. M. McLAIN,
EDWARD B. WESLEY,	W. WHITEWRIGHT, Jr.
GEO. G. WILLIAMS,	HENRY S. STOKES,
J. B. JOHNSON,	HENRY E. DAVIES,
GEO. B. CARHART,	SAMUEL WILLETS,
PETER B. SWENNEY,	CORNELIUS D. WOOD,
JAS. M. WATERBURY,	S. B. CHITTENDEN,
FREEMAN CLARK,	DANIEL C. HOWELL,
AMASA J. PARKER,	GEORGE W. CUYLER,
HENRY A. KENT,	JAMES FORSYTH,
WILLIAM F. RUSSELL,	E. J. DILLON,
S. T. FAIRCHILD,	

CHARLES T. CARLTON, Secretary.

THE BEST FIRE PROOF SAFE IN THE WORLD,



Is now Manufactured

IN CHICAGO.

-BY-

HERRING & CO.

40 STATE STREET.

The Best Bankers' Safe IN THE WORLD,

Is Manufactured in Chicago by Herring & Co.

The above Bankers' Safes are lined with the Crystallized (or Franklinitic) Iron—the only metal which cannot be drilled by a Burglar.

HERRING & CO., 40 State St.
Manufactory:—Corner 14th St. and Indiana Ave.

ILLINOIS Manufacturing Co.,

479, 481 & 483 STATE ST., CHICAGO,
Manufacturers of

RAILWAY CAR TRIMMINGS,

AND

Removable Globe Lanterns.

O. A. BOGUE, Pres. Jas. E. CROSS, Supt.
A. H. GUNN, Sec'y. J. M. A. DEW, Asst Supt

SEWER PIPE, DRAIN TILE, Bath Brick & Fire Brick,

Manufactured and Sold by

THE JOLIET MOUND CO., Joliet, Will Co., Illinois.

Office and Yard in Chicago,
Cor. Washington & Market Streets.
Orders and inquiries promptly attended to.
JOLIET MOUND CO.

H. V. & H. W. Poor, IRON AND STEEL RAILS.

FOREIGN AND DOMESTIC.

Sole Agents in the United States of the

RAILWAY STEEL & PLANT CO.

OF MANCHESTER, ENG.

Bonds Negotiated.

All business connected with Railroads.

No. 57 BROADWAY, NEW YORK.

THE

EQUITABLE

INSURANCE COMPANY.

Oriental Building,

120 La Salle St.

CHICAGO.

Capital, \$200,000.

SAMUEL HOARD, President.

IRA Y. MUNN, Vice Pres't.

W. M. EGAN, Treasurer.

O. W. BARRETT, Secretary.

IRON AND BRASS CASTINGS.

Murray Iron Works Company,
BURLINGTON, IOWA.

Castings in Iron, Brass, Gun and Bell metals, of every description, in green or dry sand or loam, with or without Patterns. Especial attention to

Car Brasses, Rabbit Metal, and Locomotive Hells.

Sole Agents for

WATERS' PATENT LINE EXTRACTING HEATER,

- AND -

Bartlett's Pat. Automatic Lubricating Sleeve.

C. L. RICE, President.

SAM'L R. BARTLETT, Sec. and Treas.

HARRISBURG

CAR MANUFACTURING CO.,

Harrisburg, Pennsylvania,

MANUFACTURE

Passenger, Mail,

Baggage, Box,

Gondola, Coal,

AND ALL OTHER KINDS OF

RAILROAD CARS!

Railroad Car Wheels & Castings,

Bridge & Rolling Mill Castings,

Bridge Rods, Bolts,

-AND-

RAILROAD FORGINGS!

W. T. HILDRUP, Superintendent.

WILLIAM COLDER, President.

MOORE Steel Elastic Car Wheel Co.

OF NEW JERSEY.

Proprietors of
MOORE'S PATENT
FOR THE MANUFACTURE OF

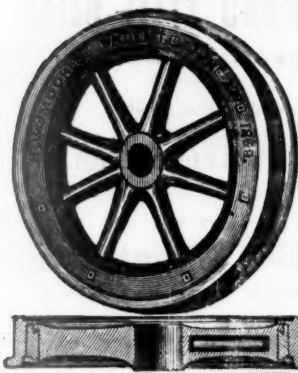
ELASTIC CAR WHEELS.

FOR PASSENGER AND SLEEPING COACHES.
Noiseless, Safe, Durable and Economical.

Also, Manufacturers of
CAR WHEELS OF EVERY DESCRIPTION.

H. W. MOORE, President.
JAS. K. FROTHINGHAM, Secretary.
F. W. BLOODGOOD, Treasurer.

Works, cor. Green and Wayne Sts. JERSEY CITY, N. J.
P. O. Address- Box 120, Jersey City, N. J.



LEBANON MANUFACTURING COMPANY,

LEBANON, PENNSYLVANIA,

IS PREPARED TO BUILD AT SHORT NOTICE,

HOUSE, GONDOLA, COAL, ORE,

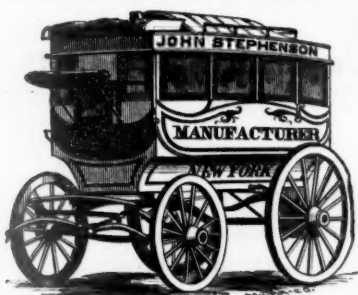
And all other Kinds of

CARS!

Also, IRON and Every Description of CAR CASTINGS Made to Order.

DR. C. D. GLONINGER, President.

J. M. GETTEL, Superintendent.



OMNIBUSES

—OF—

EVERY STYLE!

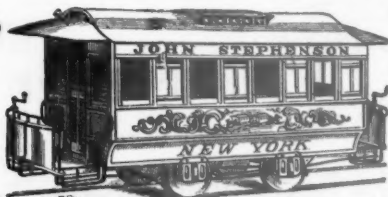
Orders Promptly Filled.

CARS,

LIGHT, STRONG

—AND—

ELEGANT!



HUSSEY, WELLS & CO.,

MANUFACTURERS OF ALL DESCRIPTIONS OF

CAST STEEL!

BEST REFINED STEEL FOR EDGE TOOLS.

Particular attention paid to the Manufacture of

Steel for Railroad Supplies.

HOMOGENEOUS PLATES,

For Locomotive Boilers and Fire Boxes.

Smoke Stack Steel, Cast Steel Forgings,

FOR CRANK PINS, CAR AXLES, &C.

Also Manufacturers of the Celebrated Brand,

"Hussey, Wells & Co. Cast Spring Steel,"

For Elliptic Springs for Railway Cars and Locomotives.

Office and Works, Pittsburgh, Pa.

BRANCH WAREHOUSES:

88 MICHIGAN AVENUE, CHICAGO.

139 & 141 Federal St. Boston. | 30 Gold St. New York.



TAYLOR BROTHERS & CO.

CAST STEEL LOCOMOTIVE TYRES,

Best Yorkshire Bar Iron

—AND—
BOILER PLATES.

This Iron is unequalled for strength and durability, soundness and uniformity. It is capable of receiving the highest finish, which renders it peculiarly adapted to the manufacture of Locomotive and Gun Parts, Cotton and other Machinery, Chain Bolts, &c.

Sole Agency for the United States and Canada.

The National Iron Co.

[Successor to Wm. Hancock, Rough and Ready Iron Works.]

ESTABLISHED 1847.

DANVILLE, PENNSYLVANIA.

MANUFACTURER OF

RAILROAD IRON,

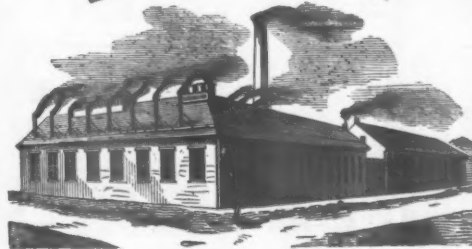
RAILROAD CHAIRS, SPLICE BARS AND BOLTS, FROGS, SWITCH RODS, STANDS AND LEVERS, HOOKHEAD AND COUNTERSUNK HEAD SPIKES, BRIDGE AND CAR BOLTS, ROLLS AND ROLLING MILL MACHINERY, BLAST FURNACE CASTINGS AND MACHINERY, STEAM ENGINES AND BOILERS, IRON AND BRASS CASTINGS, ENGINE AND MACHINE WORK, STEAM & WATER FITTINGS, &c., &c.

WM. HANCOCK, President.

BENJ. J. WELCH, Sec., Treas. and P. C. BRINCK, Vice-President, 401 Gen. Manager, Danville, Pa. Walnut St., Philadelphia.

F
I
L
E
S

LANCASTER FILE CO.

F
I
L
E
S

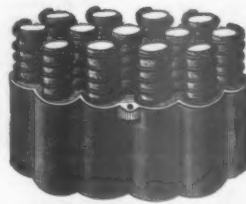
MANUFACTURERS OF

Superior Cast Steel Files.

LANCASTER, PA.

Union Car Spring Mfg Co.

Sole Proprietors of th



Wool-Packed Spiral.



Hobbard.

HEBBARD CAR SPRING!

Offices: No. 4 Dey St., New York, and 19 Wells St., Chicago.

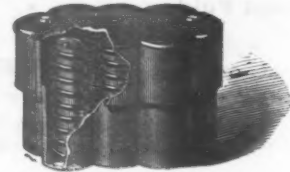
FACTORIES: JERSEY CITY, N. J., and SPRINGFIELD, MASS.

Vose, Dinsmore & Co., NATIONAL SPRING WORKS,

MANUFACTURERS OF



Volute Buffer Spring.



Group Rubber Center Spiral Spring.

VOLUTE BUFFER, INDIA RUBBER, RUBBER
CENTRE SPIRAL, COMPOUND SPIRAL,

AND OTHER

RAILWAY CAR SPRINGS.

No. 1 Barclay St., NEW YORK. | No. 15 La Salle St., CHICAGO.

WORKS ON 129th AND 130th STREETS, NEW YORK.

GENERAL FREIGHT DEPARTMENT.

The Illinois Central Railroad

ARE PREPARED TO TAKE FREIGHT FOR

Cairo, St. Louis, Peoria,

BLOOMINGTON, SPRINGFIELD, JACKSONVILLE,

And All Points in the Central and Southern parts of the State;

MOBILE & NEW ORLEANS BY RAIL OR RIVER

And ALL POINTS on the MISSISSIPPI below CAIRO. Also, to

Freeport, Galena and Dubuque.

Freight Forwarded with Promptness and Despatch, and Rates at all times as LOW as by any other Route.

BY THE COMPLETION OF THE BRIDGE AT DUNLEITH,

THEY ARE ENABLED TO TAKE FREIGHT TO ALL POINTS WEST OF DUBUQUE

WITHOUT CHANGE OF CARS!

DELIVER FREIGHT IN CHICAGO ONLY at the FREIGHT DEPOT of the Company, foot of South Water St. Parties ordering Goods from the East should have the packages marked:

"Via Illinois Central Railroad."

For THROUGH BILLS OF LADING, and further information, apply to the LOCAL FREIGHT AGENT at Chicago, or to the undersigned.

M. HUGHITT, Gen. Supt.

J. F. TUCKER, Gen. Freight Agt.

GEO. C. CLARKE.

SAM'L M. NICKERSON.

Geo. C. Clarke & Co.,

FIRE, INLAND AND OCEAN MARINE

INSURANCE AGENCY.

15 Chamber of Commerce, Chicago.

New England M. M. Insurance Co., of Boston,

ASSETS \$1,197,000.

Independent Insurance Company, - of Boston,

ASSETS \$680,000.

North American Fire Ins. Co., of New York,

ASSETS \$800,000.

Excelsior Fire Insurance Co., - of New York,

ASSETS \$340,000.

Fulton Fire Insurance Company, of New York,

ASSETS \$400,000.

Home Insurance Company, - of Columbus, O.

ASSETS \$515,000.

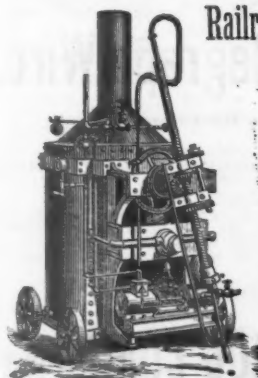
LESCHOT'S PATENT

DIAMOND POINTED

Steam Drills!

— FOR —

Railroad Grading, Well Boring, Prospecting, &c.

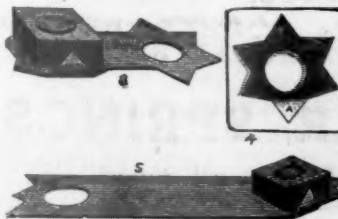


The unequalled efficiency and economy of these DRILLING MACHINES are fully established, and they are fast superseding all other inventions for ROCK DRILLING. They are constructed of various sizes and patterns to suit different classes of work, being adapted to Channelling and Gading in quarries; to shafting, tunneling, prospecting and all open cut work in mines; also to heavy Railroad-grading and Sub-marine Blasting. They operate noiselessly without percussion: and produce a perfectly cylindrical hole of uniform diameter. Their usual rate of boring is three to five (3 to 5) inches per minute in hard rock; eight to ten (8 to 10) inches per minute in slate and sand rock, and eighteen to twenty-two (18 to 22) inches per minute in coal. TEST CORES, in the form of solid cylinders of rock or mineral may be taken out of mines from any depth—not exceeding one thousand (1,000) feet—showing the geological formation, character of mineral deposits, &c. These drills never need sharpening and no steel is consumed in boring—as the cutting points (composed of rough, uncut diamonds,) are practically indestructible. Boilers, Engines, Steam Pumps, and all necessary tools furnished with drills. Illustrated circular sent on application.

SEVERANCE & HOLT, Manufacturers, Office, 16 Wall Street, New York

Office for the Western States at Eagle Works, 48 Canal St., Chicago. J. C. VINTON, Agent.

THE UNION PATENT STOP WASHER,



Manufactured at Coatesville, Chester Co., Pa., on the line of the Pennsylvania Central R. R., has now stood the test of practical use on the above road, the Philadelphia, Wilmington & Baltimore and Philadelphia & Reading Railroads, for the past two years, and proved itself to be what is claimed for it—a perfect security against the unscrewing or receding of nuts. Its simplicity, efficiency and cheapness over any other appliance for the purpose should recommend it to the attention of all persons having charge of Railroad tracks, cars and machinery.

It is especially adapted to, and extensively used by leading Railroads of the country for the purpose of securing nuts on railway joints. The accompanying cuts show the application of the Washer. For further information, apply to

A. GIBBONS, Coatesville, Pa.

THE

"RED LINE!"

—RUNNING OVER THE—

Michigan Southern and Lake Shore R. R.'s,

— WAS THE —

FIRST LINE to CARRY FREIGHT BETWEEN the EAST and WEST, WITHOUT CHANGE OF CARS!

CARS RUN THROUGH TO

NEW YORK AND BOSTON,

IN FOUR AND FIVE DAYS!

Contracts made at the Offices of the Line.

C. Shutter, Agent, 347 Broadway, New York.

A. Cushman, Agent, Old State House, Boston, Mass.

W. D. MANCHESTER, Agent, 54 Clark St., Chicago.

Great Central Route.

"BLUE LINE."

ORGANIZED JANUARY 1, 1867.



1870.

1870.

OWNED AND OPERATED BY THE

Michigan Central, Illinois Central, Chicago, Burlington & Quincy, Chicago & Alton, Great Western (of Canada), New York Central, Hudson River, Boston & Albany, and Providence and Worcester Railroads.

THE "BLUE LINE" is the only route that offers to shippers of freight the advantages of an unbroken gauge through from Chicago to the Seaboard, and to all Interior Points on the line of Eastern Connections beyond Suspension Bridge and Buffalo. All Through Freight is then transported between the most distant points of the roads in interest.

WITHOUT CHANGE OF CARS!

The immense freight equipment of all the roads in interest is employed, as occasion requires, for the through service of this Line, and has of late been largely increased. This Line is now prepared to extend facilities for the transit and delivery of all kinds of freight in Quicker Time and in Better Order than ever before.

The Blue Line Cars

are all of a solid, uniform build, thus largely lessening the chances of delay from the use of cars of a mixed construction, and the consequent difficulty of repairs, while remote from their own roads. The Blue Line is operated by the railroad companies who own it, without the intervention of intermediate parties between the Roads or Line and the public.

Trains run through with regularity IN FOUR OR FIVE DAYS to and from New York and Boston. Especial care given to the Safe and Quick Transport of Property Liable to Breakage or Injury, and to all Perishable Freight.

Claims for overcharges, loss or damage, promptly settled upon their merits. Be particular and direct all shipments to be marked and consigned via

"BLUE LINE."

FREIGHT CONTRACTS given at the offices of the company in Chicago, New York and Boston.

J. D. HAYES, GEN. MANAGER, Detroit.

C. E. NOBLE, 349 Broadway, N. Y.

P. K. RANDALL, 69 Washington St., Boston

GEO. E. JARVIS, Quincy, Ill.

W. W. STREET, 91 Lake St., Chicago

N. D. MUNSON, Quincy, Ill.

J. JOHNSON, Cairo, Ill.

THOS. HOOPS, GEN. FR'T AGT. Michigan Central Railroad, Chicago.

A. WALLINGFORD, AGT. M. C. & G. W. R. R., No. 91 Lake St., Chicago.

N. A. SKINNER, Freight Agent Michigan Central Railroad.

Empire Line.

THE EMPIRE TRANSPORTATION COMPANY'S

Fast Freight Line to the East

—AND—

TO THE COAL AND OIL REGIONS,

Via Michigan Southern, Lake Shore, and Philadelphia & Erie R. R.'s, WITHOUT TRANSFER!

Office, No. 72 LaSalle Street, Chicago.

GEO. W. RISTINE, Western Superintendent, Cleveland, Ohio.

W. G. Van Demark, 265 Broadway, New York. E. L. O'Donnell, Baltimore, Md.

G. B. McCulloch, 42 South 5th St., Philadelphia. Wm. F. Smith, Erie, Penn.

JOHN WHITTAKER, Pier 14 North River, New York.

JOSEPH STOCKTON, Agent, Chicago.

W. T. HANCOCK, Contracting Agent.

WM. F. GRIFFITHS, Jr., Gen. Freight Agent, Philadelphia.

CHICAGO, ROCK ISLAND & PACIFIC RAILROAD.

THE DIRECT ROUTE FOR
JOLIET, MORRIS, OTTAWA, LASALLE, PERU, HENRY, PEORIA,
Lacon, Geneseo, Moline,
ROCK ISLAND, DAVENPORT,
Muscatine, Washington, Iowa City,
GRINNELL, NEWTON, DES MOINES.

COUNCIL BLUFFS & OMAHA!

CONNECTING WITH TRAINS ON THE UNION PACIFIC RAILROAD, FOR
Cheyenne, Denver, Central City, Ogden, Salt Lake,
White Pine, Helena, Sacramento, San Francisco,
And Points in Upper and Lower California; and with Ocean Steamers at San Francisco, for all Points in
China, Japan, Sandwich Islands, Oregon and Alaska.

TRAINS LEAVE their Splendid new Depot, on VanBuren Street, Chicago, as follows:

	LEAVE	ARRIVE
PACIFIC EXPRESS, (Sunday excepted).....	10.00 a. m.	3.35 p. m.
PERU ACCOMMODATION, (Sundays excepted).....	5.00 p. m.	9.50 a. m.
PACIFIC EXPRESS, (Saturdays excepted,).....	10.00 p. m. (Mon. ex.)	6.00 a. m.

ELEGANT PALACE SLEEPING COACHES!

Run Through to Peoria and Council Bluffs, Without Change.

Connections at LA SALLE, with Illinois Central Railroad, North and South; at PEORIA, with Peoria, Pekin & Jacksonville Railroad, for Pekin, Virginia, &c.; at PORT BYRON JUNCTION, for Hampton, LeClaire, and Port Byron; at ROCK ISLAND, with Packets North and South on the Mississippi River.

For Through Tickets, and all desired information in regard to Rates, Routes, etc., call at the Company's Office, No. 37 South Clark Street, Chicago.

A. M. SMITH, Gen. Pass. Agent. HUGH RIDDLE, Gen. Supt. P. A. HALL, Asst. Gen. Supt.

LEAVENWORTH, LAWRENCE

— AND —

GALVESTON R. R. OF KANSAS.

The SHORTEST and ONLY DIRECT ROUTE to the celebrated
Neosho and Verdigris Valleys of Kansas, and will be opened for business to
the Border of Indian Territory, by October 1st, 1870.

TWO DAILY PASSENGER TRAINS EACH WAY, connecting at LAWRENCE
with KANSAS PACIFIC TRAINS for all parts of the EAST, WEST and NORTH, and at end of Track
with KANSAS STAGE COMPANY'S Line of Coaches for all parts of

INDIAN TERRITORY, TEXAS & NEW MEXICO.

Ask for Tickets via L. L. & G. R. R., for all points South of Kansas Pacific
Railroad. Freight taken from any part of the East to end of track WITHOUT BREAKING BULK.

CHAS. B. PECK, M. R. BALDWIN,
Gen. Freight and Ticket Agent, Lawrence, Kan. Acting Superintendent, Lawrence, Kan.

CHAS. J. PUSEY, P. O. Address—Box 5222. EDW'D H. PARDEE.

Pusey & Pardee, 74 BROADWAY, NEW YORK.

American and English Rails, LOCOMOTIVES AND CARS FISH-PLATES, SPIKES, &c.

—SOLE AGENTS FOR—

Atkins Brothers' Pottsville Rolling Mills, and G.
Buchanan & Co., of London.

Special attention given to filling orders for small T and STREET RAILS, of every
weight and pattern.

OLD RAILS BOUGHT OR RE-ROLLED, AS DESIRED.

J. E. FRENCH. W. S. DODGE. D. W. CROSS.

Winslow Car Roofing Company.

PATENT IRON CAR ROOFS.

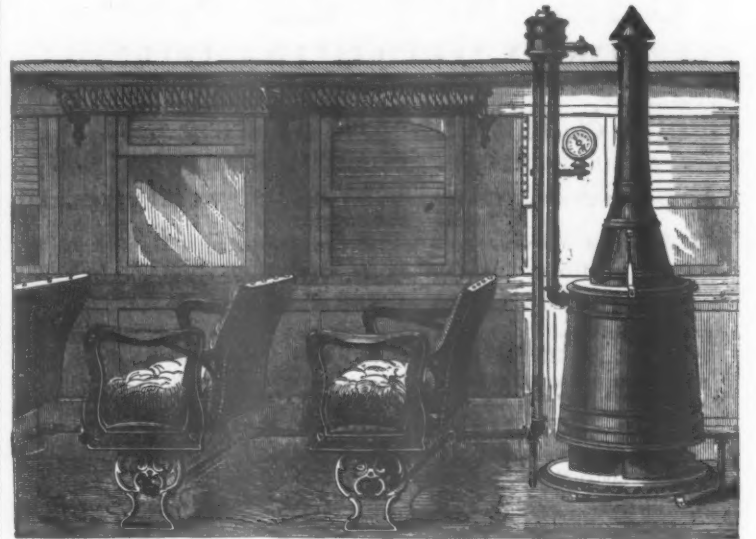
Established, 1859.

No. 211 Superior St. CLEVELAND, O.

Over 20,000 Cars covered with this Roof! We claim that these
Roofs will keep Cars dry, and will last as long as the
Cars they cover without any extra expense
once put on.

SEND FOR CIRCULARS.

WARMING AND VENTILATING Railroad Cars BY HOT WATER.



BAKER'S PATENT CAR WARMER.—One way of Applying it.

A very simple, safe and efficient plan for

Warming Railway Carriages!

— BY —

HOT WATER PIPES,

WHICH RADIATES THE HEAT DIRECTLY AT THE FEET OF EACH PASSENGER WITHOUT THE
NECESSITY OF GOING TO THE STOVE TO GET WARMED!

All the finest Drawing-Room and Sleeping Cars in the United States have it, or are adopting it.
Full descriptive pamphlets furnished on application.

Baker, Smith & Co.,

Cor. Greene and Houston Sts., N. Y., and 127 Dearborn St., Chicago.

MOWRY

Car & Wheel Works,

MANUFACTURERS OF

Railroad Cars, Wheels and Axles, Chilled Tires,

AND ALL DESCRIPTIONS OF

Engine, Car, and Bridge Castings, of any Pattern
Wheels of all sizes constantly on hand.

A. L. MOWRY, President, N. G. GREEN, Treas. and Supt.,
NEW YORK CITY. CINCINNATI, OHIO

OFFICES: No. 80 Broadway, New York; No. 69 West 3d Street, Cincinnati, Ohio.
WORKS: Cor. Lewis and East Front Streets, Cincinnati, Ohio.

American Compound Telegraph Wire.

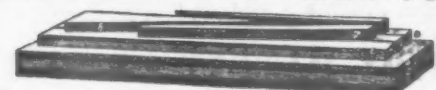
More than 3000 Miles now in Operation,

Demonstrating beyond question its superior working capacity, and great ability to withstand the
elements. For RAILROAD LINES, connecting a single wire with a large number of Stations, and for long
circuits, this wire is peculiarly adapted; the large conducting capacity secured by the copper, with
other advantages, rendering such lines fully serviceable during the heaviest rains.

Having a core of steel, a small number of poles only are required, as compared with iron wire con-
struction, thereby preventing much loss of the current from escape and very materially reducing cost
of maintenance. OFFICE AMERICAN COMPOUND TELEGRAPH WIRE CO.

BLISS, TILLOTSON & CO., Western Agents,
247 South Water Street, Chicago.

MANSFIELD ELASTIC FROG COMPANY



OF CHICAGO.

AMOS T. HALL, President. J. H. DOW, Superintendent.

Are now prepared to receive and promptly execute orders for RAILROAD FROGS and CROSSINGS
warranted to prove satisfactory to purchasers.

For DURABILITY, SAFETY and ELASTICITY—being a combination of Steel, Boiler Plate and
Wood—they are UNEQUALED, as Certificates of Prominent Railroad Officials will testify.

The SAVING TO ROLLING STOCK AND MOTIVE POWER is at least equal to double the cost of
the FROG. Orders should be addressed to

CRERAR, ADAMS & CO., Gen'l Agents,

No. 18 Wells Street, CHICAGO

CHICAGO & NORTHWESTERN R. W.

Comprising the PRINCIPAL RAILROADS from CHICAGO Directly NORTH NORTH-WEST and WEST.

ALL RAIL TO THE PACIFIC OCEAN!

Great California Line.

TRAINS LEAVE WELLS STREET DEPOT AS FOLLOWS:

8:15 A. M. Cedar Rapids Pass 9:15 P. M. Night Mail.
10:30 A. M. Pacific Express. 9:15 P. M. Rock Island Pass
10:30 A. M. Rock Island Exp. 4:00 P. M. Dixon Passenger.
For Sterling, Rock Island, Fulton, Clinton, Cedar Rapids, Boone, Denison, Missouri Valley Junction, Sioux City, Council Bluffs and Omaha, there connecting with the

UNION PACIFIC R. R.
For Cheyenne, Denver, Ogden, Salt Lake, the White Pine Silver Mines, Sacramento, San Francisco, and all parts of Nebraska, Colorado, New Mexico, Arizona, Wyoming, Montana, Idaho, Utah, Nevada, and the PACIFIC COAST.

FROM CHICAGO Hours. 1st Class Fare. FROM CHICAGO Days. 1st Class Fare.
To OMAHA..... 23 \$20.00 To SACRAMENTO, 4 1/2 \$118.00
" DENVER..... 52 70.75 " SAN FRANCISCO, 5 118.00

TRAINS ARRIVE:—Night Mail, 7:00 a. m.; Dixon Passenger, 11:40 a. m.; Pacific Express, 3:50 p. m.; Rock Island Express, 3:50 p. m.; Cedar Rapids Passenger, 6:50 p. m.

FREEMPORT LINE.

9.00 A. M. & 9.45 P. M. For Belvidere, Rockford, Freeport, Galena, Dunleith, and St. Paul.
4.00 P. M., Rockford Accommodation.
5.30 P. M., Geneva and Elgin Accommodation
6.10 P. M., Lombard Accommodation.
5:50 P. M., Junction Passenger.

TRAINS ARRIVE:—Freeport Passenger, 2:30 a. m.; 3:00 p. m.; Rockford Accommodation, 11:10 a. m.; Geneva and Elgin Accommodation, 8:45 a. m.; Junction Passenger, 8:10 a. m.; Lombard Accommodation, 6:50 a. m.

WISCONSIN DIVISION.

Trains leave Depot, cor. West Water and Kinzie Sts., daily, Sundays excepted, as follows:
10.00 A. M. DAY EXPRESS, for Janesville, Monroe, Whitewater, Madison, Prairie du Chien, Watertown, Minnesota Junction, Portage City, Sparta, La Crosse, St. Paul, and ALL POINTS ON THE UPPER MISSISSIPPI RIVER; Ripon, Berlin, Fond du Lac, Oshkosh, Neenah, Appleton, and Green Bay.
3.00 P. M., Janesville Accommodation.

5.00 P. M. NIGHT EXPRESS, for Madison, Prairie du Chien, Watertown, Minnesota Junction, Portage City, Sparta, La Crosse, St. Paul, and ALL POINTS ON THE UPPER MISSISSIPPI RIVER; Ripon, Berlin, Fond du Lac, Oshkosh, Neenah, Appleton, Green Bay, and THE LAKE SUPERIOR COUNTRY.
5.30 P. M., Woodstock Accommodation.

6:20 P. M., Barrington Passenger.
TRAINS ARRIVE:—5:30 a. m., 7:45 a. m., 10:10 a. m., 1:00 p. m. and 7:15 p. m.

MILWAUKEE DIVISION.

MILWAUKEE MAIL, (ex. Sun.) Waukegan, Kenosha, Racine and Milwaukee, 8:00 A. M.
EXPRESS, (ex. Sun.) Waukegan, Kenosha, Racine and Milwaukee, 9:45 A. M.
EVANSTON PASSENGER, 11:40 A. M.
HIGHLAND PARK PASSENGER, 1:15 P. M.
MILWAUKEE ACCOMMODATION, with Sleeping Car attached, 11:00 P. M.
EVANSTON ACCOMMODATION, (Daily) from Wisconsin Div. Depot, 1:30 P. M.
KENOSHA ACCOMMODATION, (Sundays excepted) from Wells St. Depot, 4:15 P. M.
AFTERNOON PASSENGER, from Milwaukee Div. Depot, 5:00 P. M.
WAUKEGAN ACCOMMODATION, (except Sundays) from Wells St. Depot, 5:25 P. M.
WAUKEGAN PASSENGER, (Sundays excepted) from Wells St. Depot, 6:15 P. M.
TRAINS ARRIVE:—Night Accommodation, with Sleeping Car, 5:00 a. m.; Day Express, 4:10 p. m.; Milwaukee Mail, 10:10 a. m.; Afternoon Passenger, 8:00 p. m.; Waukegan Accommodation, 8:25 a. m.; Kenosha Accommodation, 9:10 a. m.; Evanston Accommodation, 1:40 and 4:00 p. m.; Waukegan Passenger, 7:55 a. m.; Highland Park Passenger, 3:45 p. m.

PULLMAN PALACE CARS ON ALL NIGHT TRAINS.

THROUGH TICKETS Can be purchased at all principal Railroad Offices East and South, and in Chicago at the Southeast corner of Lake and Clark Streets, and at the Passenger Stations as above.

H. P. STANWOOD,
Gen. Ticket Agt.

GEO. L. DUNLAP,
Gen'l Supt.

Western Union Railroad.

CHICAGO & NORTHWESTERN DEPOT, MILWAUKEE & CHICAGO DEPOT,
CHICAGO. MILWAUKEE.

THE DIRECT ROUTE!

CHICAGO, RACINE & MILWAUKEE,

—TO—

Beloit, Savanna, Clinton, Pt. Byron, Davenport, Mineral Point, Madison, Freeport, Fulton, Lyons, Rock Island, Sabula, Galena, Dubuque, Des Moines, Council Bluffs,

OMAHA, SAN FRANCISCO

AND ALL PRINCIPAL POINTS IN

Southern and Central Wisconsin, Northern Illinois, and Central and Northern Iowa.

FRED. WILD,
Gen. Ticket Agent.

D. A. OLIN,
Gen. Superintendent.

CRERAR, ADAMS & CO.,

MANUFACTURERS AND DEALERS IN

Railroad Supplies!

—AND—

CONTRACTORS' MATERIAL.

11 and 13 Wells Street,

CHICAGO, ILL.

Manufacturers of IMPROVED HEAD-LIGHTS for Locomotives, Hand and Signal Lamps, Car and Station Lamps, Brass Dome Casings, Dome Mouldings, Cylinder Heads, and Car Trimmings, of Every Description



Pan-Handle

—AND—

Penn'a Central Route East!

SHORTEST AND QUICKEST ROUTE, VIA COLUMBUS, TO

PITTSBURGH, BALTIMORE, PHILADELPHIA & NEW YORK

On and after Saturday, JULY 10th, 1870, Trains for the East will run as follows:

[DEPOT CORNER CANAL AND KINZIE STS., WEST SIDE.]

8:10 A. M. DAY EXPRESS.

[SUNDAYS EXCEPTED.] Via Richmond. Arriving at

COLUMBUS... 3:35 A. M. HARRISBURG... 10:35 P. M. NEW YORK... 6:40 A. M. WASHINGTON... 5:50 A. M. PITTSBURGH... 12:00 M. PHILADELPHIA 3:10 A. M. BALTIMORE... 3:30 A. M. BOSTON... 5:05 P. M.

7:40 P. M. NIGHT EXPRESS.

[SATURDAYS EXCEPTED.] Arriving at:

COLUMBUS... 11:15 A. M. HARRISBURG... 5:10 A. M. NEW YORK... 12:10 P. M. WASHINGTON... 1:10 P. M. PITTSBURGH... 7:05 P. M. PHILADELPHIA 9:35 A. M. BALTIMORE... 9:00 A. M. BOSTON... 11:50 P. M.

Palace Day and Sleeping Cars

Run Through to COLUMBUS, and from Columbus to NEW YORK, WITHOUT CHANGE!

ONLY ONE CHANGE TO NEW YORK, PHILADELPHIA, OR BALTIMORE!

CINCINNATI & LOUISVILLE AIR LINE SOUTH.

42 Miles the Shortest Route to Cincinnati,

18 Miles the Shortest Route to Indianapolis and Louisville.

—FROM ONE TO—

2 Hours the Quickest Route to Cincinnati!

THE SHORTEST AND BEST ROUTE TO

Columbus, Chillicothe, Hamilton, Wheeling, Parkersburg, Evansville, Dayton, Zanesville, Marietta, Lexington, Terre Haute, Nashville,

ALL POINTS IN CENTRAL & SOUTHERN OHIO, & INDIANA, KENTUCKY & VIRGINIA.

—QUICK, DIRECT AND ONLY ALL RAIL ROUTE TO—

New Orleans, Memphis, Mobile, Vicksburg, Charleston, Savannah,

AND ALL POINTS SOUTH.

Cincinnati, Indianapolis and Louisville Trains run as follows:

THROUGH WITHOUT CHANGE OF CARS!

8:10 A. M. 7:40 P. M.

(Sundays excepted) Arriving at

(Saturdays excepted.) Arriving at

LOGANSPORT... 1:15 P. M. LOGANSPORT... 1:30 A. M.
KOKOMO... 2:35 P. M. KOKOMO... 3:45 A. M.
CINCINNATI... 8:30 P. M. CINCINNATI... 10:50 A. M.
INDIANAPOLIS... 8:00 P. M. INDIANAPOLIS... 8:40 A. M.
LOUISVILLE... 11:30 P. M. LOUISVILLE... 3:50 P. M.

Lansing Accommodation: Leaves 5:10 P. M. Arrives 8:55 A. M.

Dolton Accommodation: Leaves 10:10 A. M. Arrives 3:25 P. M.

PULLMAN'S PALACE SLEEPING CARS!

Accompany all Night Trains between Chicago and Cincinnati or Indianapolis.

Ask for Tickets via COLUMBUS for the East, and via "The AIR LINE" for Cincinnati, Indianapolis, Louisville and points South. Tickets for sale and Sleeping Car Berths secured at 95 RANDOLPH STREET, CHICAGO, and at Principal Ticket Offices in the West and Northwest.

WM. L. O'BRIEN,
Gen. Pass. and Ticket Agent, Columbus.

I. S. HODSDON,
Northwestern Pass. Agt., Chicago.

D. W. CALDWELL, Gen. Supt. Columbus.

KANSAS PACIFIC RAILWAY.

Great Smoky Hill Route!

—TO—

COLORADO, NEW MEXICO, ARIZONA, UTAH,

Montana, Nevada, California and Northern States of Old Mexico.

COMPLETED THROUGH KANSAS, TO

Carson, Colorado, 487 Miles West of Kansas City and Leavenworth.

Close Connections are made with Express Trains of the HANNIBAL & ST. JOSEPH and NORTH MISSOURI RAILROADS, at KANSAS CITY, and with MISSOURI PACIFIC RAILROAD at STATE LINE.

DAILY EXPRESS TRAINS are run between

KANSAS CITY, LEAVENWORTH, LAWRENCE,

Topeka, Wamego, Manhattan, Junction City, Salina, Brookville, HAWKER, HAYS and CARSON.

Pullman's Sleeping Cars Attached to Night Express Trains!

Passenger Time from Kansas City to Denver, Less than 50 Hours.

Hughes & Co.'s Four-Horse Concord Coaches leave Carson daily for Denver, Central City, Georgetown, &c.

Southern Overland Passenger Express and Mail Coaches leave Carson daily for Fort Lyon, Pueblo, Trinidad, Fort Union, Las Vegas, Santa Fe, &c.

Ask for Through Tickets via Kansas Pacific Railway, "Smoky Hill Route." Freight and Passage Rates as Low and Time as Quick as by any other Route.

R. B. GENNELL, Gen. Ticket Agent

A. ANDERSON, Gen. Supt.

THE FAVORITE THROUGH PASSENGER ROUTE!

Chicago, Burlington & Quincy RAILROAD LINE.

3 THROUGH EXPRESS TRAINS DAILY!

FROM CHICAGO	Hours.	1st Class Fare.	FROM CHICAGO	Days.	1st Class Fare.
TO OMAHA, - - -	23	\$20.00	TO DENVER, - - -	2 1/2	\$68.70
" ST. JOSEPH, - -	21	19.50	" SACRAMENTO, - -	4 1/2	118.00
" KANSAS CITY, -	22	20.00	" SAN FRANCISCO, -	5	118.00

TRAINS LEAVE CHICAGO from the Great Central Depot, foot of Lake Street, as follows:

BURLINGTON, KEOKUK, COUNCIL BLUFFS & OMAHA LINE.

7:40 A. M. MAIL AND EXPRESS. (Except Sunday,) stopping at all stations; making close connections at Mendota with Illinois Central for Amboy, Dixon, Freeport, Galena, Danieith, Dubuque, LaSalle, El Paso, Bloomington, &c.

10:45 A. M. PACIFIC FAST LINE. (Except Sunday,) stopping at Buda, Kewanee, Galva, Galesburg, and all Stations West and South of Galesburg.

An ELEGANT DAY COACH and a PULLMAN PALACE DRAWING ROOM CAR attached to this train daily from Chicago.

TO COUNCIL BLUFFS & OMAHA WITHOUT CHANGE!

5:00 P. M. EVENING EXPRESS. (Daily, except Sunday,) in direct connection with the celebrated New York and Chicago Lightning Express Trains of all Eastern Lines, for Burlington, Ottumwa, Des Moines, Nebraska City, Council Bluffs, Omaha, and all points West. Pullman Drawing-Room Sleeping Car attached to this Train daily from Chicago to Ottumwa without change!

11:30 P. M. NIGHT EXPRESS. (Daily, except Saturday,) stopping at all principal stations between Chicago and Burlington. ELEGANT DAY COACHES, and a PULLMAN PALACE SLEEPING CAR are attached to this train from Chicago to Burlington, without change! This is the only Route between

CHICAGO, COUNCIL BLUFFS & OMAHA,

— RUNNING THE CELEBRATED —

Pullman Palace Dining Cars!

49 MILES THE SHORTEST ROUTE BETWEEN

Chicago & Keokuk,

And the Only Route Without Ferrying the Mississippi River!

QUINCY, ST. JOSEPH, LEAVENWORTH & KANSAS CITY LINE.

10:45 A. M. PACIFIC EXPRESS. (Daily, except Sunday,) with an Elegant Day Coach and one of PULLMAN'S PALACE SLEEPING CARS attached, running through from Chicago to KANSAS CITY, Without Change!

5:00 P. M. EVENING EXPRESS. (Daily, except Sunday,) with Pullman Palace Drawing Room Sleeping Car attached, running through from Chicago to QUINCY, Without Change!

11:30 P. M. NIGHT EXPRESS. (Daily, except Saturday,) with Pullman Palace Sleeping Car attached from Chicago to GALESBURG; PALACE DAY COACHES from Chicago to QUINCY, Without Change!

64 MILES THE SHORTEST AND ONLY ROUTE BETWEEN

Chicago and Kansas City!

WITHOUT CHANGE OF CARS OR FERRY.

115 MILES The Shortest Route bet. Chicago & St. Joseph.

THE SHORTEST, BEST AND QUICKEST ROUTE BETWEEN CHICAGO AND

Atchison, Weston, Leavenworth, Lawrence,

AND ALL POINTS ON THE KANSAS PACIFIC R.R.

Local Trains Leave: (RIVERSIDE & HINSDALE ACCOMMODATION, 7:00 A. M. 1:30 & 6:15 P. M.)
MENDOTA PASSENGER.....4:15 P. M.
AURORA PASSENGER.....6:30 P. M.

Trains Arrive:—Mail and Express, 3:45 p. m.; Atlantic Exp., 4:15 p. m., except Sunday; Night Exp., 9:05 a. m., except Monday; Mendota Passenger, 10:00 a. m.; Aurora Passenger, 8:15 a. m.; Quincy Passenger 7:30 P. M.; Riverside and Hinsdale Accommodation, 6:30 and 9 a. m. and 5:30 p. m., except Sunday.

Ask for Tickets via Chicago, Burlington & Quincy Railroad, which can be obtained at all principal offices of connecting roads, and at Company's office in Great Central Depot, Chicago, at as low rates as by any other route.

ROB'T HARRIS, Gen'l Superintendent, CHICAGO. SAM'L POWELL, Gen'l Ticket Agent, CHICAGO. E. A. PARKER, Gen. West. Pass. Agt., CHICAGO.

PASSENGERS GOING WEST!

To Missouri, Kansas, Nebraska, Colorado or New Mexico, Should Buy Tickets via the Short Route

HANNIBAL & ST. JOSEPH R. R. LINE.

Three Express Trains from Quincy or Macon to St. Joseph.

— ALSO DIRECT —

To Kansas City

WITHOUT CHANGE OF CARS!

CONNECTIONS ARE CLOSE AND DIRECT FOR

ATCHISON, WESTON & LEAVENWORTH.

CONNECTIONS:

AT KANSAS CITY, with Kansas Pacific Railway, for Lawrence, Ottawa, Topeka, Fort Riley Junction City, Fort Hays, Sheridan, &c.

AT KANSAS CITY, with Kansas City, Fort Scott, and Galveston Railroad, for Fort Scott, Fort Gibson, Galveston, &c.

AT ST. JOSEPH, with St. Joseph & Council Bluffs Railroad, ALL RAIL from St. Joseph to

Nebraska City, Council Bluffs & Omaha

AT OMAHA, with Nebraska Union Pacific Railroad, for Fort Kearney, Julesburg, Cheyenne, Laramie, Benton, &c.

AT COUNCIL BLUFFS, for Sioux City, all Rail.

By this Line, passengers have choice of Overland Routes, either via Smoky Hill or Platte Route To Denver, Central City, Salt Lake, Sacramento, California and all points in the Mining Regions.

daily Overland Coaches via Smoky Hill Route leave Sheridan, end of U. P. R. R., for Santa Fe and New Mexico.

Through Tickets for Sale at all Ticket Offices.

P. B. Groat, Gen. Ticket Agent. GEO. H. NETTLETON, Gen. Supt. HENRY STARRING, Gen. Agent, Chicago.

Old, Reliable, Air-Line Route!

CHICAGO, ALTON & ST. LOUIS R. R.

SHORTEST, QUICKEST AND ONLY DIRECT ROAD TO

Bloomington, Springfield, Jacksonville, Alton,

— AND —

ST. LOUIS!

WITHOUT CHANGE OF CARS.

THE ONLY ROAD MAKING IMMEDIATE CONNECTIONS AT ST. LOUIS, WITH MORNING AND EVENING TRAINS

— FOR —

ATCHISON, LEAVENWORTH, KANSAS CITY,

Lawrence, Topeka, Memphis, New Orleans,

And All Points South and Southwest.

TRAINS leave CHICAGO from the West-side Union Depot, near Madison Street Bridge.

EXPRESS MAIL, [Except Sundays].....	8:10 A. M.
LIGHTNING EXPRESS, [Except Saturdays and Sundays].....	9:50 P. M.
NIGHT EXPRESS, [Daily].....	6:00 P. M.
JOLIFT ACCOMMODATION, [Except Sundays].....	4:40 P. M.
JACKSONVILLE EXPRESS, [Daily].....	6:00 P. M.

Trains arrive at Chicago at 8:00 P. M., 8:30 A. M. and 6:00 A. M. Joliet Accom., 9:40 A. M.

This is the ONLY LINE Between CHICAGO & ST. LOUIS RUNNING

Pullman's Palace Sleeping and Celebrated Dining Cars!

BAGGAGE CHECKED THROUGH.

Through Tickets can be had at the Company's office, No. 55 Dearborn street, Chicago, or at the Depot, corner of West Madison and Canal streets, and at all principal Ticket Offices in the United States and Canada. Rates of Fare and Freights as low as by any other Route.

A. NEWMAN, Gen. Pass. Agent.

J. C. McMULLIN, Gen. Supt.

North Missouri R. R.

PASSENGERS FOR

KANSAS AND THE WEST,

ARE REMINDED THAT

THE NORTH MISSOURI R. R.

— IS —

11 MILES SHORTER than any other Route!

BETWEEN

St. Louis and Kansas City.

15 Miles Shorter between ST. LOUIS and LEAVENWORTH

— AND —

49 MILES SHORTER TO ST. JOSEPH! THAN ANY OTHER LINE OUT OF ST. LOUIS.

Three Through Express Trains Daily!

Pullman's Celebrated Palace Sleeping Cars on all Night Trains!

FOR TICKETS, apply at all Railroad Ticket Offices, and see that you get your Tickets via St. Louis and North Missouri Railroad.

C. N. PRATT, Gen. Eastern Agt., 111 Dearborn-st. CHICAGO.

S. H. KNIGHT, Gen. Superintendent, ST. LOUIS.

JAS. CHARLTON, Gen. Pass. and Ticket Agt., St. Louis.

Pacific Railroad of Missouri.

THE MOST DIRECT AND RELIABLE ROUTE FROM ST. LOUIS THROUGH TO

KANSAS CITY, LEAVENWORTH & ATCHISON,

WITHOUT CHANGE OF CARS!

Close Connections at KANSAS CITY with Missouri Valley, Missouri River, Ft. Scott & Gulf, and Kansas Pacific R'ys, for Weston, St. Joseph, Junction City, Fort Scott, Lawrence, Topeka, Sheridan, Denver, Fort Union, Santa Fe, and

ALL POINTS WEST!

At SEDALIA, WARRENSBURG and PLEASANT HILL, with Stage Lines for Warsaw, Quincy, Bolivar, Springfield, Clinton, Osceola, Lamar, Carthage, Granby, Neosho, Baxter Springs, Fort Gibson, Fort Smith, Van Buren, Fayetteville, Bentonville.

PALACE SLEEPING CARS on all NIGHT TRAINS.

Baggage Checked Through Free!

THROUGH TICKETS for sale at all the Principal Railroad Offices in the United States and Canada. Be Sure and Get your Tickets over the PACIFIC R. R. OF MISSOURI.

W. B. HALE, Gen. Pass. and Ticket Agt.

THOS. McKISSOCK, General Superintendent.

THREE HOURS IN ADVANCE OF ALL OTHER ROUTES!
Sixty-One Miles the Shortest Line! Only 27 Hours!

— FROM —
CHICAGO TO NEW YORK.

Pittsburgh, Ft. Wayne & Chicago and Pennsylvania Central

IS THE ONLY ROUTE RUNNING ITS ENTIRE TRAIN THROUGH TO PHILADELPHIA AND NEW YORK, AND THE ONLY ROUTE RUNNING

THREE DAILY LINES OF PULLMAN'S DAY AND SLEEPING PALACES,

— FROM CHICAGO TO —

PITTSBURGH, HARRISBURG, PHILADELPHIA & NEW YORK,

WITHOUT CHANGE!

WITH BUT ONE CHANGE TO

**BALTIMORE, PROVIDENCE, NEW HAVEN,
 HARTFORD, SPRINGFIELD, WORCESTER AND BOSTON!**

And the Most Direct Route to Washington City.

Trains Leave WEST SIDE UNION DEPOT, corner West Madison and Canal Streets, as follows:

LEAVE:	Mail	Fast Express	Pacific Exp.	Night Exp.	VALENTINE & CO. EXPRESS
CHICAGO	5.50 A. M.	11.00 A. M.	5.15 P. M.	9.00 P. M.	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
PLYMOUTH	9.50 "	1.50 P. M.	9.10 "	2.13 A. M.	
FORT WAYNE	12.40 P. M.	3.30 "	11.30 "	5.30 "	
LIMA	3.15 "	"	1.25 A. M.	8.10 "	
FOREST	4.37 "	"	2.48 "	9.40 "	
CRESTLINE	6.00 A. M.	8.55 "	4.30 "	12.05 P. M.	
MANFIELD	6.42 "	7.16 "	5.09 "	12.34 "	
ORRVILLE	9.05 "	8.42 "	6.45 "	1.27 "	
ALLIANCE	10.45 "	9.55 "	8.40 "	2.55 "	
ROCHESTER	12.05 P. M.	12.17 A. M.	10.52 "	4.08 "	
PITTSBURGH	3.15 "	12.50 "	12.45 P. M.	7.50 "	Leaves Chicago daily, except Saturday and Sunday; leaves Pittsburgh daily, except Sunday; has PULLMAN PALACE CARS from Chicago to Pittsburgh, and from Altoona to Philadelphia. This train arrives in BALTIMORE Nine Hours, and WASHINGTON Seven Hours, in Advance of all other Lines!
BLAIRSVILLE BRANCH	6.05 "	"	2.49 "	9.54 "	
JOHNS TOWN	6.56 "	"	3.37 "	10.42 "	
CRESSON	7.58 "	"	4.38 "	11.43 "	
ALTOONA	9.03 "	8.40 "	5.45 "	12.55 A. M.	
HUNTINGDON	10.31 "	"	7.04 "	1.45 "	
LEWISTOWN	11.44 "	"	8.23 "	2.59 "	
HARRISBURG	1.10 A. M.	8.35 "	10.45 "	5.30 "	
LANCASTER	3.40 "	"	12.15 A. M.	7.00 "	
DOWNTOWN	5.00 "	"	1.40 "	8.16 "	
ARRIVE:					
PHILADELPHIA	6.30 "	12.20 "	3.10 "	9.40 "	
NEW YORK, via PHILADELPHIA	10.41 "	3.00 "	6.43 "	1.00 P. M.	
NEW YORK, via ALLENTOWN	"	3.50 "	"	12.05 P. M.	
BALTIMORE	"	12.10 "	4.30 "	9.00 A. M.	
WASHINGTON	"	3.40 "	5.50 "	1.00 P. M.	
BOSTON	9.00 P. M.	5.50 A. M.	5.05 P. M.	11.50 "	

BOSTON AND NEW ENGLAND PASSENGERS will find this Route especially Desirable, as it Gives them an opportunity of Seeing the **FINEST VIEWS AMONG THE ALLEGHANY MOUNTAINS,**

Besides Visiting PITTSBURGH, PHILADELPHIA and NEW YORK, without extra cost!

All New England Passengers holding Through Tickets, will be Transferred, with their Baggage, to Rail and Boat Connections in **NEW YORK, WITHOUT CHANGE.**

Close Connections Made at Lima for all Points on the Dayton & Mich. and Cin., Hamilton & Dayton R'y's,

And at CRESTLINE, for CLEVELAND, ERIE, DUNKIRK, BUFFALO, NIAGARA FALLS, and all Points reached via Lake Shore R. R.

THROUGH TICKETS for sale at the Company's Offices, at 65 Clark St., and also at 52 Clark St.; cor. Randolph and Wells St.; at N. E. corner of Randolph and LaSalle Sts.; and at Depot, Chicago. Also at Principal Ticket Offices in the West.

F. R. MYERS, Gen. Pass. and Ticket Agt, P. & F. W. R'y, Chicago. W. C. OLELAND, Gen. Western Pass. Agt, P. Ft. W. & C. R'y, Chicago.
 T. L. KIMBALL, Gen. Western Pass. Agent, Penn. Central R. R., Chicago.

J. H. LINVILLE, PRESIDENT. J. L. PIPER, GEN. MANAGER. A. G. SHIFFLER, SUPT. & TREAS.
The Keystone Bridge Company
 OF PITTSBURGH, PENN.

Office and Works, 9th Ward, Pittsburgh, Pa. Philadelphia Office, 436 Walnut Street.
 GENERAL WESTERN OFFICE:—13 Fullerton Block, 94 Dearborn St.,
 CHICAGO, ILL.

This Company possesses unrivaled facilities for manufacturing and erecting every description of Iron and Wooden Railway and Road Bridges, Roofs, Turn-Tables and Buildings, "Linville and Piper" Patent Iron Bridges, Self-Sustaining Pivot Bridges, Suspension Bridges, and Ornamental Park Bridges. Contractors for Wooden or Iron Bridges of any pattern, as per plans and specifications. Circulars sent on application.

WALTER KATTE, ENGINEER.

A. D. CHERY, SECRETARY.

PITTSBURGH CAST STEEL SPRING WORKS.

A. French & Co.,

Manufacturers of Extra Tempered, Light Elliptic

CAST STEEL SPRINGS,

FOR RAILROAD CARS AND LOCOMOTIVES,

FROM BEST CAST STEEL.

OFFICE AND WORKS:—Cor. Liberty and 21st Sts., PITTSBURGH, PA.

CHICAGO BRANCH, 88 Michigan Ave.

Broad Gauge! Double Track!
ERIE RAILWAY.

4 EXPRESS TRAINS DAILY!
 From Cleveland, Dunkirk and Buffalo, 625 Miles, to New York, WITHOUT CHANGE of Coaches!

The Trains of this Railway are run in DIRECT CONNECTION WITH ALL WESTERN AND SOUTHERN LINES, for

Elmira, Williamsport, Oswego, Great Bend, Scranton, Newburgh,

**NEW YORK, ALBANY, BOSTON, PROVIDENCE,
 AND PRINCIPAL NEW ENGLAND CITIES.**

New and Improved DRAWING ROOM COACHES are attached to the DAY EXPRESS Running THROUGH TO NEW YORK.

SLEEPING COACHES, Combining all Modern Improvements, with perfect Ventilation and the peculiar arrangements for the comfort of Passengers incident to the BROAD GAUGE, accompany all night trains to New York.

CONNECTIONS CERTAIN! as Trains on this Railway will, when necessary, wait from one to two hours for Western trains.

All Trains of Saturday run directly Through to New York.

Ask for Tickets via Erie Railway, which can be procured at 66 Clark Street, Chicago, and at all Principal Ticket offices in the West and Southwest.

L. D. RUCKER, A. J. DAY, WM. R. BARR,
 Gen'l Superintendent, New York. | Western Passenger Agent, Chicago. | Gen'l Passenger Agent, New York.

LAKE SHORE — AND — MICHIGAN SOUTHERN R.W.

THE GREAT THROUGH LINE BETWEEN
CHICAGO, BUFFALO & NEW YORK,
WITHOUT CHANGE!

AND THE ONLY RAILWAY

RUNNING PALACE COACHES THROUGH!

— BETWEEN —

CHICAGO & NEW YORK, via BUFFALO

WITHOUT TRANSFER OF PASSENGERS!

All Trains Stop at Twenty-Second Street to Take and Leave Passengers.
Baggage Checked at that Station for all Points East.

4 EXPRESS TRAINS DAILY, [Sundays Excepted,] Leave
Chicago from the New Depot, on Van Buren St., at the head of La Salle Street, as follows

7:30 A. M. MAIL TRAIN.
VIA OLD ROAD AND AIR LINE. SUNDAYS EXCEPTED.

Leaves 221 Street 7:45 A. M. Stops at all Stations. Arrives—Toledo, 6:20 P. M.

11:30 A. M. SPECIAL NEW YORK EXPRESS,
A AIR LINE. SUNDAYS EXCEPTED.

Leaves—Twenty-Second Street, 11:45 A. M. Arrives—Elkhart, 2:55 P. M.; Cleveland 10:40 P. M.; Buffalo, 4:10 A. M.; New York, 5:30 P. M.; (Chicago Time) Boston, 11:45 P. M.

This Train has PALACE SLEEPING COACH Attached, Running
THROUGH TO ROCHESTER, WITHOUT CHANGE!

IN DIRECT CONNECTION WITH

Wagner's Celebrated Drawing-Room Coaches on N. Y. Central R. R.

Only Thirty Hours, Chicago to New York!

5:15 P. M. ATLANTIC EXPRESS (Daily),
VIA OLD ROAD.

Leave—Twenty-Second Street 5:30 P. M. Arrives—Laporte, 8:10 P. M. (Stops 20 minutes or Supper); arrives at Toledo, 2:50 A. M.; Cleveland, 7:25 A. M. (30 minutes for Breakfast); arrives at Buffalo, 1:50 P. M.; Rochester, 5:10 P. M. (30 minutes for Supper); connects with Sleeping Coach running Through from Rochester to Boston Without Change, making but One Change between Chicago and Boston.

NEW AND ELEGANT SLEEPING COACH Attached to this Train, Running
THROUGH from CHICAGO TO NEW YORK WITHOUT CHANGE! Arrives
at NEW YORK, 6:40 A. M.

9:00 P. M. NIGHT EXPRESS
VIA AIR LINE. (DAILY EXCEPT SAT. & SUN.)

Leaves—Twenty-Second Street, 9:15 P. M. Arrives—Toledo, 6:00 A. M. (30 minutes for Breakfast); arrives at Cleveland, 10:35 A. M.; Buffalo, 5:30 P. M.; New York, 11:00 A. M.; Boston, 3:50 P. M.

KALAMAZOO DIVISION.

Leave Chicago 11:30 A. M. Arrive at Kalamazoo 6:05 P. M.;
Grand Rapids, 9:25 P. M.

Leave Chicago 9:00 P. M. Arrive at Kalamazoo 6:50 A.
M.; Grand Rapids, 9:40 A. M.

Elkhart Accommodation leaves Chicago, 3:30 P. M. Arrives
at Elkhart, 8:20 P. M.

There being no heavy grades to overcome, or mountains to cross, the road bed
and track being the smoothest and most perfect of any railway in the United States, this Company run
their trains at a high rate of speed with perfect safety.

Travelers who wish to SAVE TIME and make SURE CONNECTIONS,
purchase Tickets via

LAKE SHORE & MICHIGAN SOUTHERN R'Y.

THE ONLY LINE RUNNING THROUGH BETWEEN CHICAGO AND
BUFFALO, WITHOUT TRANSFER, and in Direct Connection with NEW YORK
CENTRAL RAILROAD and ERIE RAILWAY.

General Ticket Office for Chicago, No. 56 Clark Street.

CHAS. F. HATCH,
General Superintendent, CLEVELAND, OHIO

F. E. MORSE,
General Western Passenger Agent, CHICAGO.

ILLINOIS CENTRAL RAILROAD.

PASSENGER TRAINS LEAVE CHICAGO FROM THE GREAT CENTRAL DEPOT, FOOT OF LAKE ST

ST. LOUIS AND CHICAGO THROUGH LINE.

9:30 A. M. DAY EXPRESS Sundays Ex.
Arriving in ST. LOUIS at 10:15 P. M.

This Train Reaches St. Louis ONE HOUR & FIFTEEN MINUTES in Advance of any other Route!

8:30 P. M. FAST LINE. Saturdays Excepted.
Arriving at ST. LOUIS at 8:00 A. M.

AT ST. LOUIS, Direct Connections are Made FOR

Jefferson City, Sedalia, Pleasant Hill, Macon, Kansas City,
LEAVENWORTH, ST. JOSEPH & ATCHISON,

—Connecting at KANSAS CITY for—

LAWRENCE, TOPEKA, JUNCTION CITY, SALINA, SHERIDAN, &c.

CAIRO, MEMPHIS AND NEW ORLEANS LINE.

9:30 A. M. CAIRO MAIL, Sundays Excepted.
Arriving at Cairo 2:30 A. M., Memphis 12:40 P. M., Mobile 9:40 A. M.
Vicksburg 9:30 A. M., New Orleans 11:10 A. M.

8:30 P. M. CAIRO EXPRESS, Except Saturdays.
Arriving at Cairo 3:15 P. M., Memphis 2:30 A. M., Vicksburg 5:00 P. M., New Orleans 1:30 A. M.

4:55 P. M. CHAMPAIGN PASSENGER,
Arriving at Champaign at 11:15 P. M.

THIS IS THE ONLY DIRECT ROUTE TO

Humboldt, Corinth, Grand Junction, Little Rock, Selma, Canton,
Grenada, Columbus, Meridian, Enterprise,

MEMPHIS, VICKSBURG, NEW ORLEANS & MOBILE.

At NEW ORLEANS, connections are made for

GALVESTON, INDIANOLA,

And all Parts of Texas.

NOTICE.—This Route is from 100 to 150 MILES SHORTER, and from
12 to 24 HOURS QUICKER than any other.

THIS IS ALSO THE ONLY DIRECT ROUTE TO

DECATUR, TERRE HAUTE, VINCENNES & EVANSVILLE.

Peoria and Keokuk Line.

9:30 A. M. KEOKUK PASSENGER, Sun. Excepted.
Arriving at Chenoa 3:15 P. M., El Paso 4:05 P. M., Peoria 5:40 P. M.,
Canton 7:14 P. M., Bushnell 8:59 P. M., Keokuk 11:36 P. M., Warsaw 12:05 A. M.

Elegant Drawing Room Sleeping Cars

ATTACHED TO ALL NIGHT TRAINS.

Spacious and Fine Saloon Cars!

WITH ALL MODERN IMPROVEMENTS, RUN UPON ALL TRAINS.

BAGGAGE CHECKED THROUGH TO ALL IMPORTANT POINTS.

For Through Tickets, Sleeping Car Berths, Baggage Checks, and Information, apply at the office
of the Company in the Great Central Depot, foot of Lake St.

Hyde Park and Oakwoods Train.

HYDE PARK TRAIN	LEAVE	ARRIVE	HYDE PARK TRAIN	LEAVE	ARRIVE
HYDE PARK TRAIN	7:30 A. M.	7:45 A. M.	HYDE PARK TRAIN	3:00 P. M.	3:15 P. M.
HYDE PARK TRAIN	8:00 A. M.	9:15 A. M.	HYDE PARK TRAIN	8:10 P. M.	7:35 P. M.
HYDE PARK TRAIN	12:10 P. M.	1:30 P. M.			

* Sundays Excepted.

W. P. JOHNSON, Gen. Pass. Agent.

M. HUGHITT, Gen. Supt.

1870. Great Central Route! 1870.

SPEED! COMFORT! SAFETY!

MICHIGAN CENTRAL and GREAT WESTERN RAILWAYS!

The Great Central Route, via Niagara Falls, to

NEW YORK AND NEW ENGLAND.

Pullman's Magnificent Palace Drawing-Room Cars,

— FROM —

CHICAGO TO NEW YORK CITY, WITHOUT CHANGE.

4 PASSENGER TRAINS LEAVE CHICAGO, DAILY EXCEPT SUNDAY.
(DEPOT, FOOT OF LAKE STREET,) as Follows:

5:00 A. M. MAIL TRAIN. Stops at all Stations.
(SUNDAYS EXCEPTED.) Arrives DETROIT at 5:40 P. M.

11:30 A. M. SPECIAL NEW YORK & BOSTON EXP.
(SUNDAYS EXCEPTED.) Arrives at Michigan City 1:13 P. M.; New Buffalo 1:31; Niles 2:15. (Dinner); Kalamazoo 3:33 P. M.; Battle Creek 4:28; Marshall 4:48; Jackson 5:45; Detroit 7:55; London 12:05, A. M. Hamilton 3:35 A. M.; Toronto 9:20, Suspension Bridge 3:53, Rochester 7:00 A. M.; Albany, 3:00 P. M.; NEW YORK, 6:25, BOSTON, 11:50 P. M. This train connects at ROCHESTER (7:00 A. M.) with

Wagner's Magnificent Palace Drawing-Room Cars!
RUNNING THROUGH TO NEW YORK, WITHOUT CHANGE!

5:15 P. M. ATLANTIC EXPRESS.
(DAILY.) Arrives at Michigan City, 7:18 P. M.; Niles 8:30 P. M. (Supper); Kalamazoo, 10:25 P. M.; Jackson, 1:00 A. M.; Detroit 3:40, London, 8:35, (Break fast); Hamilton 11:40, Suspension Bridge 1:30 P. M.; Rochester 5:00 P. M.; Albany, 1:30 A. M.; NEW YORK, 6:40 A. M.; BOSTON, 11:00 A. M. A MAGNIFICENT DRAWING-ROOM SLEEPING CAR is attached to this train daily, FROM CHICAGO TO NEW YORK CITY. The celebrated

Hotel Drawing-Room Car is also attached to this Train from Chicago to Rochester!

These, together with ELEGANT DAY CARS TO SUSPENSION BRIDGE, make this Train the favorite Train for all points East.

SPECIAL NOTICE.—Boston and New England Passengers will please notice that this Train now makes direct connection through. A SLEEPING CAR is attached at Rochester at 5:20 P. M., running through to Springfield, Mass., thus avoiding transfer at Albany. Breakfast at Springfield. This Train reaches Springfield early enough second morning to Connect with all Trains up and down the Connecticut.

9:00 P. M. NIGHT EXPRESS.

(SAT. & SUN. EXCEPTED.) Arrives at Michigan City, 11:08 P. M.; Niles, 12:25 A. M.; Kalamazoo, 2:00; Marshall, 3:13; Jackson, 4:25; Grand Trunk Junction, 7:00; Detroit, 7:30; London, 1:45 P. M.; Hamilton, 4:35; Toronto, 9:35; Niagara Falls, 6:15; Buffalo, 7:15 P. M.; Rochester, 9:10; Syracuse, 12:25 A. M.; Rome, 1:05; Utica, 2:35; Albany, 6:30 A. M.; NEW YORK, 10:00 A. M.; BOSTON, 3:40 P. M.

PULLMAN'S PALACE SLEEPING CARS ARE ATTACHED TO THIS TRAIN FROM CHICAGO TO DETROIT,
And from Suspension Bridge to New York.

WE INVITE THE ATTENTION OF THE TRAVELER to the SPLENDID EQUIPMENTS of this FIRST-CLASS LINE TO THE EAST!

FOR THROUGH TICKETS, and any and all information, Sleeping Car accommodations, &c., apply at General Office in Tremont House Block, at office in Great Central Depot; also at No. 60 Clark street, under Sherman House; at Grand Trunk Railway Office, 45 Clark street, or at New York Central Railroad Office, No. 53 Clark street, and at office under Briggs House.

H. E. SARGENT, Gen. Supt. M. C. R. R.

W. K. MUIR, Gen. Supt. Gt. Western R. W.

HENRY C. WENTWORTH, Gen. Pass. Agt.

CHICAGO, INDIANAPOLIS & LOUISVILLE THROUGH LINE!

— VIA —

MICHIGAN CENTRAL RAILROAD.

THE ONLY ROUTE TO

TO LOUISVILLE, WITHOUT CHANGE OF CARS.

TWO EXPRESS TRAINS Leave Chicago Depot, Foot of Lake as Follows:

9:00 A. M. MORNING EXPRESS.
(EXCEPT SUNDAY.) Arriving at LaFayette, 2:25 P. M.; Indianapolis, 6:00 P. M.; Louisville, 11:30 P. M.

4:30 P. M. AFTERNOON EXPRESS.
(EXCEPT SATURDAY) Arriving at Michigan City 6:20 P. M. (Supper); LaFayette, 11:30 P. M.; Indianapolis, 2:15 A. M.; Louisville, 7:00 A. M.; Nashville, 4:00 P. M.

A GOOD SLEEPING CAR is Attached to this Train Every Night,
And goes from Chicago to Louisville WITHOUT CHANGE!

SPECIAL NOTICE.—This Train stops at Michigan City for Supper, and waits at that point for Michigan Central Atlantic Express East, leaving Chicago at 4:45 p. m. Passengers going South, and wishing as much time in Chicago as possible, can take the 4:45 p. m. Michigan Central Atlantic Express, and connect without fail at Michigan City, with above Through Louisville Express.

THE GREAT BRIDGE ACROSS THE OHIO at Louisville being completed, passengers are relieved of the omnibus transfer.

FOR THROUGH TICKETS, via this line, apply at offices of connecting lines and at all Ticket offices in Chicago.

HENRY C. WENTWORTH, Gen. Pass. Agent.

Michigan Central R. R. LOCAL CONNECTIONS:

Chicago & Michigan Lake Shore Railroad.

Open from New Buffalo to St. Joseph, Mich.

5:00 A. M. AND 4:30 P. M. Trains from Chicago Connect at New Buffalo.

Kalamazoo, Allegan & Grand Rapids R. R.

Open to Grand Rapids.

11:30 A. M. AND 9:00 P. M. Trains from Chicago Connect at Kalamazoo.

Peninsular Railroad of Michigan.

Open to Charlotte.

5:00 A. M. AND 9:00 P. M. Trains from Chicago Connect at Battle Creek.

Jackson, Lansing & Saginaw Railroad.

Open to Bay City, Mich. Passing through Lansing and Saginaw.

5:00 A. M. AND 9:00 P. M. Trains from Chicago Connect at Jackson.

GRAND TRUNK RAILWAY.

All Michigan Central Trains Connect at Grand Trunk Junction

— FOR —

SARNIA, TORONTO, MONTREAL,
PORTLAND, BOSTON, BUFFALO, OGDENSBURG

AND ALL POINTS EAST.

H. E. SARGENT, General Superintendent.

WHAT IS SAID OF THE RAILROAD GAZETTE.

"Has been for thirteen years a live, energetic railroad newspaper, and has fought its way up among its many competitors for the favor of the railroad public, gaining in strength and rising in importance year by year, until to-day it stands second to no journal of that important class in the United States."—*Florida Daily Transcript*.

"A very neat publication in point of appearance, and, as it always has been, is now a reliable, interesting and accurate journal, ably edited in its various departments. * * * Our readers have wandered over its columns many a time and oft, and always with gratifying results."—*Buffalo Commercial Advertiser*.

"The news is very full, the discussions are conducted in good temper and with excellent information. To judge from this first number, the conductors of the *Gazette* know what 'railroading' is, and what a proper weekly journal should be."—*New York World*.

"One of our most valuable exchanges. * * * Its columns teem with reliable information of great benefit to railroad men of every section of the United States."—*Leavenworth Bulletin*.

"Emphatically a journal of transportation, and contains every conceivable item of news on the subject of railroads, steamboats, telegraphs, express companies, etc."—*Pitt (Mich.) Globe*.

"Full of information, scientific and general, with regard to railroads all over the country, their construction, operation, etc."—*Rochester Chronicle*.

"For railroad men and others wishing to keep themselves thoroughly posted on railroad matters we know of no better paper."—*Madison State Journal*.

"A most valuable thing to the engineer and all railway men, the capitalist, traveler, mechanic and general reader."—*Brooklyn (N. Y.) Argus*.

"As it devotes much attention to Southern railroad and industrial interests, it is always interesting to Southern readers."—*Galveston News*.

"Has always been one of the best papers of the country for railroad intelligence."—*New York Commercial and Financial Chronicle*.

"In every respect a worthy representative of the energetic and go-ahead city where it is published."—*Cincinnati Railroad Record*.

"Every man who is at all interested in railroads would do well to take the *Gazette*."—*Jacksonville (Ill.) Independent*.

"Of great interest to railroad men, and almost equally so to those who use railroads."—*Marshall (Mich.) Statesman*.

"Makes a very handsome appearance and is full of valuable matter."—*Chicago Evening Post*.

THE RAILROAD GAZETTE.**A Journal of Transportation.**

Devoted to the Discussion of Subjects Connected with the Business of Transportation, and the Dissemination of Railroad News.

Illustrated Descriptions of Engineering Works and Railroad Machinery and Rolling Stock.

Contributions from Practical Railroad Men, on the Business of Railroading.

A Complete Record of Railroad News.**NEW ORGANIZATIONS.****ENGINEERING AND MECHANICS.****PROGRESS OF NEW ROADS.****TRAFFIC AND EARNINGS.****ELECTIONS AND APPOINTMENTS.****LAKE AND RIVER NAVIGATION.****RAILROAD LAW.****RAILROAD MANUFACTURES.****The Cream of the American and European Technical Periodicals.****An Impartial and Independent Journal, Valuable to Every Railroad Man.****TERMS OF SUBSCRIPTION:**

Single copy, per annum, \$3.00 | Seven copies, per annum, and one to the person who gets up the club, \$30.00
Four copies, per annum, \$11.00

CANADA SUBSCRIBERS, twenty-five cents additional.

EXTRA COPIES, ordered by the quantity, will be furnished at \$5.00 per hundred.

SINGLE COPIES, ten cents each.

ADVERTISING RATES will be made known on application.

Address—

A. N. KELLOGG, Publisher,
101 Washington St., Chicago.

WHAT IS SAID OF THE RAILROAD GAZETTE.

"Has always been one of the most valuable publications in the West. * * * Is bound to continue its way as the leading railroad journal of the country."—*Sedalia (Mo.) Bazar*.

"A publication of great value to every one interested in railroads and railroading, and its scientific articles are of great value to every scholar."—*Oshkosh (Wis.) Northwestern*.

"In its financial and commercial views in connection with the railroad interests of the country, may be regarded as one of the first papers of the United States."—*Pensacola Observer*.

"It will compare favorably with any similar publication, not only in New York or Boston, but in London or on the Continent."—*Waukegan (Ill.) Gazette*.

"It appears to be in many features the best journal of its class now extant."—*New York Official Railway News*.

"An impartial and independent journal, valuable to every railroad man."—*Parkersburg (W. Va.) Times*.

"It must prove a very valuable paper to stockholders and those who are interested in railroads."—*New York Globe*.

"Unquestionably the best railroad journal in the United States."—*Waukegan (Ill.) Patriot*.

"The best informed railway newspaper published in the West."—*Aurora (Ill.) Beacon*.

"A well-edited paper, showing industry and intelligence."—*American Railway Times*.

"Well worthy the patronage of all intelligent railroad men."—*Kalamazoo Gazette*.

"Replete with matters connected with railroading."—*Holmesburg (Pa.) Gazette*.

"We regard it as the best railroad paper out."—*Peoria National Democrat*.

"Equal in appearance to any technical journal of America."—*Albion Patriot*.

"Every railroad man reads the *Gazette*."—*Bloomington (Ill.) Leader*.

"A complete repository of railroad news."—*Harrisburg (Pa.) Patriot*.

"The best journal of its class in the United States."—*La Crosse Leader*.

"Promising much for the future."—*Detroit Commercial Advertiser*.

"A model of what a railroad newspaper should be."—*Chicago Tribune*.

"An excellent journal for railroad men."—*Man-kato (Minn.) Record*.

"Of great interest to railroad men."—*Delaware (O.) Gazette*.

Undoubtedly the Best Watches now Made are the

Genuine Waltham Watches!

— AND THE —

BEST WATCH FOR RAILWAY ENGINEERS, CONDUCTORS AND TRAVELERS,

Is the one Bearing the Trademark,

"American Watch Company, Crescent Street, Waltham, Mass."**THIS WATCH IS ESPECIALLY MADE FOR RAILWAY USE,**

And Surpasses any other Full-Plate Watch made in this Country, in Finish and Superior Workmanship.

THE AMERICAN WATCH CO.

IS THE ONLY COMPANY IN THE COUNTRY THAT MAKES BOTH WATCH AND CASE UNDER ONE SUPERVISION.

✓ A Full Assortment always on hand.

N. MATSON & CO., 117 Lake St., Chicago.

JACOB R. SHIPHERD & CO.,

155 and 157 LaSalle Street,

CHICAGO.

RAILWAY BANKERS

NEGOTIATE

MORTGAGE BONDS,

And Local Bonds issued in Aid;

Make Advances; Complete Unfinished Roads, etc., etc.

F. E. Canda,
BRIDGE BUILDER

—AND—

GENERAL CONTRACTOR.

No. 2 S. Clark St.,

CHICAGO, - - ILLINOIS.

"THE RAILROAD TICKET PRINTING HOUSE."**Rand, McNally & Co.,**

[TRIBUNE JOB OFFICE]

THE LEADING

PRINTERS, STATIONERS,
ENGRAVERS,

—AND—

Blank Book Manufacturers
IN THE WEST.

Railroad Printing and Stationery
a Specialty.

Consecutively Numbered Railroad Tickets,
Ticket Cases, Conductors' Patches,

DATING PRESSES, CANCELING STAMPS,
Etc., Etc., Etc.

49, 51 and 53 Clark Street,
CHICAGO.

NEWS DEALERS

Should Address Orders for

THE RAILROAD GAZETTE,

— TO —

The Western News Company,

CHICAGO.

AKRON CEMENT.

Union Akron Cement Company,
SOLE MANUFACTURERS.

OFFICE AND WAREHOUSE:

88 MARKET ST., CHICAGO.

20 Central Wharf, Buffalo.

Orders of Contractors, Railroads, and Bridge Builders, promptly filled.

KELLOGG, CLARKE & CO.,
Engineers & Iron Bridge Builders,

OF PHOENIXVILLE, PA.,

Will henceforth have their Principal Office at 410 Walnut St., Philadelphia, to which all correspondence should be addressed. Circulars, plans and prices sent on application.

IRON BRIDGES, PIVOT BRIDGES

—AND—

Turn Tables.

F. C. LOWTHORP,
Civil Engineer, Patentee & Builder,

78 E. STATE STREET,

TRENTON, N. J.

Established 1852.

CLEVELAND FILE WORKS
CLEVELAND, OHIO.

All descriptions of Files Manufactured and Recut. Also, dealers in Best English Cast Tool Steel. Orders solicited and satisfaction guaranteed.
JOHN FARLIN, Prop'r.